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HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM

SEVENTH ANNUAL REPORT OF THE SECRETARY OF TRANSPORTATION

TO THE

CONGRESS OF THE UNITED STATES

IN COMPLIANCE WITH

SECTION 144(i) OF TITLE 23, UNITED STATES CODE

OCTOBER 1986

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SENATE RESOLUTION 482 SUBMITTED BY MR. STAFFORD OF VERMONT

In the Senate of the United States, October 3 (legislative day, September 24), 1986

Resolved, That the annual report of the Secretary of Transportation to the Congress of the United States in compliance with section 144(i) of title 23, United States Code entitled "Highway Bridge Replacement and Rehabilitation Program, Seventh Annual Report to Congress" be printed as a Senate document.

SEC. 2. There shall be printed three hundred additional copies for the use of the Committee on Environment and Public Works.

Attest:

JO-ANNE L. COE,
Secretary.

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PREFACE

In 1982, Congress acknowledged the seriousness of our Nation's bridge needs by continuing the Highway Bridge Replacement and Rehabilitation Program (HBRRP). The Surface Transportation Assistance Act (STAA) of 1982 increased funding for the HBRRP to record levels and changed the governing legislation for the program in a number of other ways as well.

The STAA authorized funding for the HBRRP through FY 1986. With this authorization limit in mind, the Federal Highway Administration (FHWA) undertook a top-level management review in FY 1984 of the entire Federal-aid bridge program. The purpose of the review was to evaluate the current bridge program, determine its strong points and weaknesses, and develop recommendations, both administrative and legislative, for program improvements. The second part of this report includes a summary of the 1984 review recommendations and the resulting actions taken to strengthen the bridge program.

OBJECTIVE OF REPORT

Section 144(i) of Title 23, U.S. Code, requires an annual report to Congress on the HBRRP, the status of the National Bridge Inventory (NBI), and recommendations for program improvement.

The objective of the Seventh Annual Report is to describe in detail the progress made in administering the HBRRP through December 31, 1985. The report will also discuss the status of bridge inventories for both Federal-aid and off-system highways.

(1)

PART I

SPECIAL BRIDGE REPLACEMENT PROGRAM

Congress began the Special Bridge Replacement Program (SBRP) in 1970 and made available a total of $816.5 million through FY 1978. By law, these funds remain available until used to reimburse a State for eligible project costs. In all, 1,579 bridges have been approved for design and/or construction. Although all SBRP funds have been obligated for several years, small amounts continue to become available for reobligation in individual States when they complete ongoing projects and determine final costs. The SBRP will expire when all projects using these funds are closed out. As of December 31, 1985, the States had an SBRP unobligated balance of $.1 million.

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM

The 1978 STAA replaced the SBRP with the HBRRP and authorized a total of $4.2 billion for FY's 1979 through 1982 to improve bridges on public highways throughout the Nation. The 1982 STAA continued the HBRRP and authorized $7.05 billion for FY's 1983 through 1986. The FHWA's Washington Headquarters admini sters the HBRRP through organizational channels.

Appendix A of this report contains current regulations for the HBRRP funding program. Appendix B contains the National Bridge Inspection Standards (NBIS), which implement the requirements for bridge inspection and inventory. The FHWA continues to evaluate the HBRRP regulations and the NBIS for changes to simplify procedures and improve the cost effectiveness of the bridge programs.

The HBRRP is divided into two categories: (1) apportioned funds that are distributed according to relative State needs, and (2) discretionary funds that are set aside for allocation by the Secretary of the Department of Transportation (DOT) to replace or rehabilitate deficient, critically needed, high-cost bridges on the Federal-aid system. The Federal share is 80 percent of eligible project costs for both categories.

Apportioned Bridge Funds

Under Section 121 of the 1982 STAA, each State's apportionment factor is revised annually in view of changing needs and actual construction costs. To establish the apportionment factor, the FHWA applies construction costs to the four categories of eligible deficient bridge projects in each State. These categories are 1) replacement of Federal-aid system bridges, 2) replacement of off-system bridges, 3) rehabilitation of on-system bridges, and 4) rehabilitation of off-system bridges. The ratio of each State's need to the national need is the apportionment factor. Each State must receive at least 0.25 percent but not more than 10 percent of the total funds available.

Discretionary Bridge Funds

Discretionary bridge funds finance Federal-aid system bridge replacement or rehabilitation projects that have an estimated cost exceeding $10 million, or less than $10 million but more than twice the amount apportioned to the State in the year funds are requested. The FHWA uses proposed funding schedules submitted by the States for candidate bridges to establish master funding plans. The plans are revised annually, or more often if necessary, using the latest data furnished by the States.

The 1982 STAA directed the Secretary of Transportation to develop a regulation on the selection of discretionary bridge projects. The regulation, which went into effect December 17, 1983 (see Appendix C), includes a formula resulting in a rating factor based on criteria included in the legislation. The process gives funding priority to discretionary bridge projects already begun under the program. In addition, candidate bridges not previously selected and having a computed rating factor of 100 or less will be eligible for consideration.

The current discretionary bridge planning list as of December 31, 1985, includes 222 bridge projects that the States have submitted as candidates for replacement or rehabilitation (190 with rating factors of 100 or less, the cutoff point for consideration under the new regulation). The 222 projects would cost an estimated $6.5 billion and would require $5.2 billion in discretionary bridge funds (80 percent of eligible costs) if fully funded from the discretionary bridge category. All candidates submitted by the States are included in the planning list even though some unfunded projects are not eligible under the new regulation.

As of December 31, 1985, the DOT had selected 84 of the 222 bridge projects for funding (see Table 3). The total cost for these 84 projects is $2.9 billion, of which $1.6 billion had been allocated as of December 31, 1985 (see Table 10). The FHWA estimates that approximately $500 million more in Federal funds will be required to complete these ongoing projects (some projects are not funded at 80 percent of total project cost).

The total project cost for the remaining 116 eligible projects is $2.8 billion, and they would require approximately $2.3 billion in Federal funds if fully funded from the discretionary bridge category.

Individual State requests vary yearly as candidate projects advance in priority or are delayed. Additional projects will be submitted for the program as existing bridges continue to age and deteriorate to the point that rehabilitation or replacement is required.

Program Status

The table on page 6 shows how the status of the Nation's bridges has changed since the Sixth Annual Report. The data in the table is based on the NBI.

Each year, the FHWA asks the States to update the NBI as the required inventory and inspection program continues for all public highway bridges. Many States submit periodic updates, either in the form of a complete inventory or data for individual bridges. The total number of highway bridges, the number on the different systems, and the number of deficient bridges will continue to fluctuate with each annual report because of the ongoing inspection program, highway system changes, construction of new bridges, HBRRP projects, and demolition or closing of others (see Table 4A, 4B, 5A, and 5B).

STATUS OF THE NATION'S BRIDGES

	Sixth Annual HBRRP Report as of December 31, 1984			From NBI December 31, 1985		
	Federal-aid	Off-system	Total	Federal-aid	Off-system	Total
Number of bridges inventoried and classified	267,657	306,388	574,045	269,781	304,948	574,729
Number of structurally deficient bridges* (includes closed bridges)	33,389**	107,419**	140,808**	35,433**	100,303**	135,736**
Number of functionally obsolete bridges*	41,809**	77,558**	119,367**	40,499**	67,682**	108,181**
Number of bridges that are load posted***	18,524	79,832	98,356	20,147	92,375	112,522
Additional bridges that should be load posted***	10,947	38,558	49,505	8,990	24,861	33,851
Total bridges that are or should be load posted***	29,471	118,390	147,861	29,137	117,236	146,373
Number of bridges closed to all traffic (these bridges may be closed temporarily for repairs or closed permanently)	652	3,842	4,494	628	4,271	4,899
Total number of bridges funded under the bridge programs SBRP	1,596		1,596	1,579		1,579
HBRRP	10,479	7,767	18,246	12,155	9,243	21,398
Total	12,075	7,767	19,842	13,734	9,243	22,977
Number of replaced or rehabilitated bridges now open to traffic (SBRP & HBRRP)	5,184	3,174	8,358	6,675	4,591	11,266
Bridges under construction and/or design (SBRP & HBRRP)	6,891	4,593	11,484	7,059	4,652	11,711

* A structurally deficient bridge, as defined by FHWA, is one that (1) has been restricted to light vehicles only, (2) is closed, or (3) requires immediate rehabilitation to remain open; a functionally obsolete bridge is one on which the deck geometry, load carrying capacity (comparison of the original design load to the current State legal load), clearance, or approach roadway alignment no longer meet the usual criteria for the system of which it is an integral part.

** The number of deficient bridges (structurally deficient and functionally obsolete) reflects the FHWA's interpretation of the States' inventory data for this program, and may not agree with an individual State's records for these two categories. See pages 57 and 58 for breakdown.

*** Bridges that require load posting fall into two groups. One group includes that portion of structurally deficient bridges that have deterioritated to the extent that they cannot carry the load for which they were designed. The second group includes that portion of functionally obsolete bridges that are in good condition but the current State legal load exceeds the original design load and, therefore, the bridges require posting. The number of bridges closed, posted and should be posted but are not, are taken from the NBI as submitted by the States.

Changes in the Number of Deficient Bridges

The FHWA uses NBI data furnished by the States to identify structurally deficient and functionally obsolete bridges -- the two general classifications of deficient bridges. Structurally deficient bridges, as defined by the FHWA, are those which have been (1) restricted to light vehicles only, (2) closed, or (3) require immediate rehabilitation to remain open. Functionally obsolete bridges have deck geometry, load carrying capacity (comparison of the original design load to the current State legal load), clearance, or approach roadway alignment which no longer meet the usual criteria for the system of which they are a part. Most structurally deficient bridges are functionally obsolete as well. However, they would only be counted as structurally deficient because this is the more critical category of the two.

The fact that a bridge is "deficient," either structurally or functionally, does not imply it is unsafe. With proper load posting and enforcement, many structurally deficient bridges can continue to serve most traffic. Functionally obsolete bridges often have geometric deficiencies which can be minimized by the use of roadway striping, signs, signals, and crash cushions.

In 1985, using Federal, State and local funds, highway agencies were able to improve or replace 16,550 structures to the point that they are no longer structurally deficient. This figure compares with 10,605 structures in 1984. In addition, another 7,386 bridges previously classified as structurally deficient were removed from the NBI as the result of replacement, removal, or system realignment.

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During the same period, 18,864 bridges in the NBI were reclassified as structurally deficient. As a result of these changes in status, the number of structurally deficient bridges on the Federal-aid systems increased 6 percent (up 2,044), and the number of structurally deficient off-system bridges decreased 7 percent (down 7,116).

Of the 18,864 newly classified structurally deficient bridges at the end of 1985, 8,872 of them had been classified as functionally obsolete the previous year. Counting bridges no longer classified as structurally or functionally deficient and bridges newly classified as deficient, the Nation experienced a net decrease in the total number of deficient bridges in 1985. The total dropped from 260,175 on December 31, 1984, to 243,917 bridges at the end of 1985. This reduction reflects the removal from the deficient status of all bridges replaced or rehabilitated in the past 10 years.

Even so, the number of structurally deficient bridges improved (23,936) reflects the beneficial effect of the increased funding authorized by the 1982 act and the high priority State and local governments have placed on their bridge programs.

Sufficiency Rating

The FHWA, in consultation with the States, establishes general bridge priorities by assigning a sufficiency rating to each bridge inventoried. The lower the sufficiency rating, the higher the priority for replacement or rehabilitation. The sufficiency rating is based on the following general categories and relative percentages:

55 percent - structural adequacy and safety
30 percent - serviceability and functional obsolescence
15 percent - essentiality for public use
100 percent

From the States' inventory data, the FHWA compiles the HBRRP selection list for each State. The list includes all deficient bridges with a sufficiency rating of 80.0 or less. All bridges on the selection list are eligible for rehabilitation. All bridges with a sufficiency rating less than 50.0 are also eligible for replacement. The FHWA recommends that the States, in developing bridge projects, consider the rehabilitation alternative before deciding to replace a structure.

Estimating National Bridge Needs

Using bridge cost estimates the States submitted to the NBI, the FHWA has determined a nationwide average cost per bridge for each highway system for: (1) bridge replacement and (2) rehabilitation. These averages were used to estimate national deficient bridge costs. The following table estimates the cost to replace or rehabilitate the eligible deficient bridges to meet current standards.

ESTIMATE TO REPLACE OR REHABILITATE DEFICIENT BRIDGES
ELIGIBLE FOR THE HBRRP
Costs Include Federal and State Shares

System	Bridges Eligible for Replacement or Rehabilitation (Sufficiency Rating < 50)	Estimated Replacement Cost (in Billions)	Bridges Eligible for Rehabilitation (Sufficiency Rating 50 - 80)	Estimated Rehabilitation Cost (in Billions)	Total Cost (in Billions)
Interstate	531	$ .6	3,647	$ 2.2	$ 2.8*
Primary	8,417	8.1	12,957	5.2	13.3
Secondary	13,792	4.8	15,050	2.1	6.9
Urban	4,410	5.1	4,974	2.3	7.4
Total	27,150	$18.6	36,628	$11.8	$30.4
Off-system	109,933	16.7	48,106	3.7	20.4
Total	137,083	$35.3	84,734	$15.5	$50.8*

* Interstate bridge needs are eligible for funding under the Interstate Resurfacing, Restoration, Rehabilitation and Reconstruction (4R) Program.

The estimated cost to replace or rehabilitate all deficient bridges, $50.8 billion, has increased 5 percent since the last report, even though the number of eligible deficient bridges has decreased. The principal reason the estimated cost went up is that the States reported increased bridge replacement costs in their latest NBI submissions. The replacement costs, on the average, increased 2.6 percent while rehabilitation costs increased 6.0 percent. In addition, the number of eligible primary and urban system bridges (more costly than secondary or off-system bridges) increased. The number of primary bridges increased 901 (4.4 percent) and the number of urban system bridges increased 114 (1.2 percent). The average replacement cost of Primary and Urban system bridges is approximately 3 times the replacement cost of a Secondary system bridge and 7 times the replacement cost of an off-system bridge.

For the purposes of estimating costs, the FHWA assumes that bridges with sufficiency ratings less than 50 will be replaced. In practice, though, some of the bridges with ratings below 50 will be rehabilitated, not replaced, while others, because of funding limitations, will be neither rehabilitated nor replaced. Similarly, many of the bridges eligible only for rehabilitation will not be rehabilitated, while others may eventually be replaced (if their sufficiency ratings decrease to below 50).

In short, the figures provided are the best estimate of the cost of upgrading every deficient bridge to acceptable standards. This estimate does not mean every bridge needs immediate attention. Many projects can be deferred. Moreover, it is not economically feasible or practical to improve all deficient bridges, nor is it necessary to do so from a safety standpoint. Alternative measures can be used to allow some deficient bridges to remain safely in service indefinitely. Indeed, the States must select projects within the limits of available funds. Part two of this report will discuss some actions taken or under consideration to sharpen the focus of the Federal role and establish priorities for bridge improvements.

Not all bridges in the NBI classified as deficient are eligible for the HBRRP. For example, bridges funded for construction have been removed from the eligible list even though the existing bridges will remain in the NBI as deficient until removed by the State, usually after the structure is demolished, rehabilitation is completed, or traffic is transferred to the new bridge. Another large number of deficient bridges, about 15,702, are not eligible for the program because their sufficiency ratings are above 80. The deficiencies identified for these bridges, such as waterway adequacy, underclearance, and approach roadway, have only a minor effect on the sufficiency rating.

Currently, 221,817 oridges in the NBI are eligible for HBRRP funding. This amounts to about 39 percent of the Nation's 574,729 inventoried highway bridges. Last year's report included 236,015 eligible bridges or 41 percent of the 574,045 bridges in the Nation.

Status of Funds

Congress has authorized the following funds for the HBRRP:

HBRRP FUNDS AUTHORIZED

	FY's 1979-82 (Million)	FY 1983 (Million)	FY 1984 (Million)	FY 1985 (Million)	FY 1986 (Million)
Secretary's discretionary funds	$ 800	$ 200	$ 200	$ 200	$200
Apportioned funds excluding HPR* funds (See Tables 1A - 1C)	3,116	1,347	1,407	1,510	1,656
Acceleration of bridge projects	200	0	0	0	0
Administration	84	32	17	17	19
HPR Funds**	0	21	21	23	25
Special Funding (Eugene Talmadge Memorial Bridge)	0	0	5	0	0
Totals	$4,200	$1,600	$1,650	$1,750	$1,900***

* HPR = Highway Planning and Research. The 1982 STAA required that 1-1/2 percent of apportioned bridge funds, as well as the apportioned Federal-aid systems funds, be deducted for highway planning and research.

** These funds are the amounts derived from bridge funds; however, they are to be used for planning and research related to highways as well as bridges.

*** The Consolidated Omnibus and Reconciliation Act of 1985 changed the authorization for HBRRP from $2.05 billion to $1.9 billion.

From FY 1979 through FY 1985, the States obligated a total of $7,986 million of HBRRP funds. This amount was approximately 91.1 percent of the total discretionary and apportioned funds available (compared with the 90.7 percent shown in the Sixth Annual Report). The States obligated an additional $506.1 million during the first quarter of FY 1986. The $2.3 billion obligated in FY 1985 ($1.6 billion HBRRP and $.7 billion of other Federal-aid funds) was for work

on approximately 5,800 bridges. This includes both new projects and continuation of some previously funded projects. The following tabulation shows discretionary and apportioned fund obligations:

HBRRP OBLIGATIONS BY FISCAL YEAR

Fiscal Year	Secretary's Discretionary Fund (Million)	Apportioned Funds (Million)	Total Funds Obligated (Million)
1979	$ 178.9	$ 423.4	$ 602.3
1980	140.6	619.4	760.0
1981	164.4	730.8	895.2
1982	233.4	744.9	978.3
1983	216.2	1,196.0	1,412.2
1984	238.1	1,512.2	1,750.3
1985	206.3	1,382.1	1,588.4
1986 (1st qtr)	93.0	413.1	506.1
Total	$1,470.9	$7,021.9	$8,492.8

The $8.493 billion is an increase of $1.833 billion over the amount obligated through December 31, 1984. The $1.833 billion was used to improve 3,152 bridges.

As shown in the following table, the States are using a large share of apportioned and discretionary HBRRP funds on their primary system bridges. This is appropriate because the primary system carries a higher volume of traffic than the other systems, serves long distance and interstate traffic, and is vital to national defense.

COMPARISON OF ELIGIBLE DEFICIENT BRIDGES AND HBRRP OBLIGATIONS BY SYSTEM
From Beginning of HBRRP Through December 31, 1985

System	Total No. of Bridges	Eligible Deficient Bridges	% of Eligible Deficient Bridges	Obligated* Funds (Million)	% of Total Obligated Funds
Interstate	51,345	4,178	1.9	$ 118.8	1.4
Primary	92,351	21,374	9.6	3,742.7	44.1
Secondary	91,338	28,842	13.0	1,491.1	17.6
Urban	34,747	9,384	4.2	1,692.3	19.9
Total Fed.-aid	269,781	63,778	28.7	$7,044.9	83.0
Off-system	304,948	158,039	71.3	1,447.1	17.0
Total	574,729	221,817	100.0	$8,492.0	100.0

* Including Discretionary Bridge Funds

Section 144(g)(2) of Title 23, U.S. Code, requires the States to use at least 65 percent of each year's HBRRP apportionment on Federal-aid system bridges (see Tables 1A and 2A). In addition, the States must use no less than 15 percent of each year's apportionment on bridges off the Federal-aid systems (see Tables 1B and 2B). Thus, 20 percent of each State's HBRRP apportionment may be used on or off the Federal-aid systems at the discretion of the State (see Tables 1C and 2C).

The States are using some apportioned HBRRP funds to continue projects begun with SBRP funds. The table on page 6, which shows a decrease in the number of bridges funded under the SBRP, reflects this shift. These bridges are included now under the HBRRP.

Most States also use apportioned HBRRP funds to inventory, inspect, and evaluate bridges as required by the NBIS. Of the $225.2 million obligated for this purpose since the beginning of the HBRRP in 1979, 41 States obligated $128.8 million on the Federal-aid system and 38 States obligated $96.4 million for off-system

bridges. In addition, seven States have obligated $.8 million to inventory bridges for historic significance as authorized in the 1978 STAA. Some States use non-HBRRP funds for these reviews. Also, five States have obligated $4.0 million for load posting bridges with HBRRP funds.

In addition to the $8.0 billion of HBRRP funds obligated in FY's 1979 through 1985 ($1.6 billion in 1985) and the $506.1 million obligated in the first quarter of FY 1986, the States spent $3.6 billion of other Federal-aid funds for bridge improvements during the same period. This amount includes funds only for bridge work, not related items such as approaches, utility relocation, right-of-way costs, or funds for new bridges on new roadway alignments. The States spent an additional $6.9 billion of Federal funds for new highway bridges during this same 7-year period.

The $3.6 billion in non-HBRRP Federal-aid obligations for replacement or rehabilitation is distributed among the Federal-aid systems as follows:

OTHER FEDERAL-AID FUNDS OBLIGATED FOR BRIDGE REPLACEMENT AND REHABILITATION (in millions)

Fiscal Year

System	1979	1980	1981	1982	1983	1984	1985	1st quarter 1986	Total
Interstate	$130	$116	$198	$352	$241	$524	$446	$155	$2162
Primary	44	158	103	115	139	92	129	33	813
Secondary	12	14	16	36	40	32	54	4	208
Urban	36	35	24	51	97	98	79	9	429
Total	$222	$323	$341	$554	$517	$746	$708	$201	$3,612

Rehabilitation

The 1978 STAA expansion of the bridge program to permit rehabilitation gave the States and local governments greater flexibility in deciding how to correct deficiencies. Bridge rehabilitation projects are increasing in number. For FY 1984, the FHWA reported that the States used nearly 17.0 percent of the obligated HBRRP funds on rehabilitation projects. The percentage increased to 19.6 percent for FY 1985. Rehabilitation, which analysis often shows to be cost effective, can extend bridge service life if undertaken before deterioration reaches an advanced stage. By accomplishing rehabilitation early, a State can avoid more costly replacement, and the bridge can provide reliable service for an indefinite period. In developing HBRRP projects, the States must include cost-effective rehabilitation as an alternative to ensure efficient use of the available resources. The next table shows the number of bridges and the amount of HBRRP funds obligated for rehabilitation. These amounts are based on 21,398 bridges (page 6) and obligation of $8,492.8 million (page 14) since the beginning of the HBRRP for either replacement or rehabilitation.

HBRRP OBLIGATIONS FOR REHABILITATION
FY 1979 Through First Quarter FY 1986

System	No. of Bridges	% of Bridges Selected	Obligated* Funds (Million)	% of Funds Obligated
Interstate	151	0.7	$92.3	1.1
Primary	1,042	4.9	948.2	11.2
Secondary	385	1.8	102.6	1.2
Urban	308	1.4	396.0	4.6
Total Fed.-aid	1,886	8.8	$1,539.1	18.1
Off-system	301	1.4	127.5	1.5
Total	2,187	10.2	$1,666.6	19.6

* Including discretionary bridge funds.

Because rehabilitation has been performed on relatively large bridges, the average cost of rehabilitation is greater than the average cost of replacement. However, in most cases, rehabilitation costs far less than replacement and is a cost-effective procedure for larger bridges.

Rehabilitation is an important part of the total federally funded bridge program, not just the HBRRP. Of non-HBRRP Federal funds obligated for bridge projects, the States used over 50 percent for rehabilitation. The following table shows non-HBRRP Federal-aid funds obligated for rehabilitation.

OTHER FEDERAL-AID FUNDS OBLIGATED FOR REHABILITATION
(in millions)

Fiscal Year

System	1979	1980	1981	1982	1983	1984	1985	1st quarter 1986	Total
Interstate	$102	$114	$147	$152	$126	$262	$279	$ 98	$1,280
Primary	36	50	29	45	50	29	51	17	307
Secondary	3	5	5	7	6	7	18	1	52
Urban	28	26	19	27	38	45	34	4	221
Total	$169	$195	$200	$231	$220	$343	$382	$120	$1,860

Often, routine preventive maintenance can add many years to a bridge's useful life. In the case of older bridges, though, this extended life can be a problem because many of these structures were designed for the loads at the time of construction, not today's heavier loads. The States must evaluate the cost efficiency of replacing or rehabilitating these older bridges, and those with less than desirable widths, so they can compete for funding along with structurally deficient bridges.

Off-System Funds

As noted previously, the States must use no less than 15 percent, nor more than 35 percent, of the apportioned HBRRP funds on off-system bridges. From FY 1979 through FY 1985, the States obligated a total of $1.3 billion (19.7 percent of the total apportioned funds) for off-system bridges, including $304 million in 1985 (22.0 percent of the amount obligated during the year). The States obligated an additional $76 million in the first quarter of FY 1986, which brought total obligations for off-system bridges from the beginning of FY 1979 through the first quarter of FY 1986 to $1.376 billion.

This total includes $403 million of the $1.301 billion the States obligated from the 20 percent of apportionments that can be used on or off the Federal-aid systems. The States used the remaining $898 million of the 20-percent funds for Federal-aid system bridges.

Training

The FHWA has prepared and distributed training material to aid in the inventory and inspection of bridges. To improve the quality and techniques of bridge inspection further, contracts are underway to develop two supplements to the Bridge Inspector's Training Manual and short training courses. The two supplements are Inspection of Fracture Critical Bridge Members and Culvert Failure Analysis/Bridge Inspector's Training Manual Supplement. Both courses and the manuals are scheduled for completion in 1986.

Acceleration of Bridge Projects

Although not included directly in the HBRRP, the two Acceleration of Bridge Projects are funded separately under the bridge program (see Table 1E). Section 147 of the 1978 STAA directs the Secretary to complete two Federal-aid system projects that traverse major bodies of water. The purpose is to demonstrate

system projects that traverse major bodies of water. The purpose is to demonstrate the feasibility of reducing the time needed to replace unsafe bridges. In accordance with congressional direction, the FHWA selected the U.S. Grant Bridge over the Ohio River between Portsmouth, Ohio, and South Shore, Kentucky, and the East Huntington Bridge over the Ohio River at Huntington, West Virginia. The Kentucky approach spans of the U. S. Grant (Portsmouth) Bridge are essentially complete with construction of the main span substructure underway. Construction has not started on the Ohio approach spans. The estimated completion date is April 1988.

The West Virginia Department of Highways opened the East Huntington Bridge on August 8, 1985. Design of steel and concrete alternates is underway for an extension to connect the project to U.S. 60. However, the local government has requested study of additional alternatives. If an alternative scheme is adopted, additional time will be required to prepare project plans.

The FHWA will prepare a final report on both projects after they are completed.

Historic Bridges

As noted earlier, the States may now use HBRRP funds to inventory their bridges for historic significance. This inventory is an important step in the preservation of historic bridges. By identifying bridges of greatest historic significance that are also suitable for rehabilitation, the inventory should reduce the number and length of delays on projects involving historic and potentially historic bridges. Approximately 87 percent of the States, including the District of Columbia and Puerto Rico, have reported data on the historic significance of bridges in their NBI submittals.

64-545 O - 86 - 3

Summary

In 1985, the Nation's bridges remained a high priority of the Federal Highway Administration and the State highway agencies. The result of this priority attention is best shown by the fact that 16,550 structurally deficient bridges were improved or replaced during the year using Federal, State and local funds.

Although the States can finance bridge projects with funds from various sources, including the regular Federal-aid highway program, the HBRRP played a major role in bridge activities during 1985. The importance of the HBRRP can be shown by a number of facts:

1. The States obligated $1.588 billion in HBRRP funds during fiscal year 1985 and $.506 billion in the first quarter of fiscal year 1986, bringing HBRRP obligations to $8.492 billion since the start of the program in fiscal year 1979.

2. In addition to the $1.6 billion of HBRRP funds obligated in fiscal year 1985, the States obligated $.7 billion of Federal-aid funds from nonbridge categories for bridge replacement and rehabilitation projects, for a total of $2.3 billion.

3. During calendar year 1985, the States improved 3,152 bridges under the HBRRP, bringing the total to 21,398 since the program began.

4. The obligation rate for HBRRP funds remained high. The States had obligated 91.1 percent of all HBRRP funds through fiscal year 1985, an increase over the 90.7 percent obligated through fiscal year 1984.

In spite of the progress in 1985, the Nation's bridge problem remained serious.

1. Of the Nation's 574,729 inventoried bridges, 221,817 (39 percent) are eligible for replacement or rehabilitation under the HBRRP.

2. In 1985, 18,864 bridges were newly classified as structurally deficient.

Estimated cost of bringing all deficient bridges up to current standards is $50.8 billion, a 5-percent increase since the previous report. The increase resulted from higher bridge construction costs and the fact that the number of deficient bridges on the Federal-aid primary system and urban system increased. Bridge projects on these systems generally are more expensive than projects on the Federal-aid secondary system or on off-system bridges. This estimate is based on upgrading all eligible deficient bridges to current standards, but should not be taken to mean every deficient bridge needs immediate attention. It is not economically feasible or practical to improve all deficient bridges, nor is it necessary to do so from a safety standpoint.

PART II

BRIDGE PROGRAM MANAGEMENT

Background

In 1984, the FHWA conducted a top-level management review to evaluate administration of the entire Federal-aid bridge program. The review included questionnaires, discussions, and site visits scheduled in conjunction with NBIS reviews. The FHWA established four objectives for this review:

1. To determine whether the funds available under the bridge program are being used in an efficient and cost-effective manner.

2. To evaluate how uniformly the requirements of the bridge program are being applied nationwide.

3. To determine to what degree the States are complying with the NBIS.

4. To develop a foundation for the development and implementation of improved bridge program management techniques.

Part II of the annual report for 1984 discussed these objectives and other details of the management review. Results of the management review provided a basis for improving the program and a focus for greater FHWA and State management attention.

Recommendations

In March 1985, the FHWA Executive Director accepted the review report, including 17 recommendations for improving the bridge program. The following report discusses each of the recommendations and the status of efforts to implement them.

1. Remove Interstate bridges from eligibility for HBRRP funds.

   Through the first 7 years of the HBRRP, only 1.4 percent of the available HBRRP funds have been spent on the Interstate System. The States have found that Interstate 4R funds, made available for Interstate resurfacing, restoration, rehabilitation and reconstruction, are a more practical source of funding for bridge work on the Interstate System. Not only is the Federal share higher (90 percent compared with 80 percent), but the annual funding for Interstate 4R projects is higher than for HBRRP projects. As a result, the management review concluded Interstate bridges should be removed from eligibility for HBRRP funds. This revision will require legislative action and has been recommended in the DOT proposals for reauthorization of the Federal-aid highway program introduced as S.2189 and H.R. 4144.

2. The FHWA should issue a policy withholding Federal-aid project approvals in jurisdictions not in compliance with the NBIS.

   Under the NBIS:

   a. All bridges on public roads are to be inspected at regular intervals not to exceed 2 years, and

   b. Each bridge that is inspected shall be rated as to its safe load carrying capacity. If the maximum legal load under State law exceeds the operating rating (the absolute permissible load the structure should be subjected to), the bridge must be posted in conformance with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Maintenance Inspection of Bridges or State law.

One objective of the management review was to determine the degree of compliance with the NBIS. According to data at the time of the review, a significant number of bridges had inspection dates more than 3 years old. Similarly, a significant number of bridges that should have been load restricted were not coded by the States as being posted. In both cases, most of the bridges were off the Federal-aid system.

Since publication of the NBIS, the FHWA has promoted the benefits of bridge inspection and encouraged the States to comply. However, the approximately 85,000 bridges not inspected and 49,000 bridges not posted in accordance with the NBIS as of December 1984, indicated the FHWA should take further action. On May 14, 1985, the FHWA issued a policy memorandum that, in effect, gave noncomplying entities (States, counties, cities, etc.) 90 days to (1) correct NBIS deficiencies or (2) submit for approval by FHWA, an aggressive short-term plan to correct NBIS deficiencies. In the absence of either action, the FHWA would suspend approval of further Federal-aid projects in the jurisdiction.

Since then, most entities have reached agreements to correct deficiencies, and progress is being made to bring all local governments into compliance. However, as of December 13, 1985, the FHWA had suspended approval of some Federal-aid projects in six States. This action, rarely taken in the history of the Federal-aid highway program, underscores the importance of NBIS compliance.

The immediate effect of this policy, not taken until the middle of the year, can be shown. The table on page 6 of Part 1 of this report shows 8,990 bridges on the Federal-aid systems and 24,861 off-system bridges

should be load restricted but are not coded in the NBI as being posted. This represents an 18-percent improvement for the Federal-aid system and a 36-percent improvement for the off-system since the last report. In addition, the number of bridges not meeting the required inspection frequency decreased by 42 percent and 38 percent for the Federal-aid and off-system respectively.

3. The FHWA should define the Federal role in the bridge program.

One of the key steps in setting national goals for the bridge program is establishing what the Federal role should be in meeting them. This point is especially important: to what degree should the Federal Government continue to be involved in meeting priority off-system bridge needs?

When the Special Bridge Replacement Program began, only bridges on the Federal-aid system were eligible. Therefore, Federal attention was focused on Federal-aid system bridges.

When the 1978 STAA expanded the program to include off-system bridges, the change greatly increased the number of bridges under Federal oversight.

As of December 31, 1985, bridges on the Federal-aid systems accounted for 46.9 percent of the 574,729 bridges in the NBI. However, Federal-aid system bridges accounted for only 28.7 percent of all bridges rated deficient in the NBI.

While the Federal role in ensuring the safety of Interstate and primary system bridges is clear, the Federal role in bridge programs for other highway systems is not. Some bridges (such as those on

low-volume, remote, rural roads) are more logically the responsibility of State or local governments, which already have separate, non-Federal bridge programs in many cases.

The Department's 1986 legislative proposal defines the appropriate future Federal role in the bridge program as follows:

a. Interstate System bridges will be eligible for improvement using the funds from a combined Interstate construction, Interstate 4R, primary program.

b. Primary system bridges, except Interstate, will be eligible for HBRRP funds apportioned to the States on a "needs" basis. The Federal share of all eligible primary system bridge projects will be 75 percent.

c. Bridges on all other public highway systems will be eligible for "block grant" funds apportioned partly on the basis of bridge needs for these systems. Under the proposed legislation, the FHWA urban, secondary and non-primary bridge programs, as well as the UMTA transit formula programs, would be combined into a block grant program. Funds could be used for highway or transit projects at the discretion of State or local officials. The portion of the "block grant" ascribed to bridges will be nearly the same as the amount apportioned to the States under the existing provisions of Title 23 of the U.S. Code. However, as in past years, the funding available will remain substantially less than required to improve all non-primary bridges. The State or local government will determine how much of the "block grant" funds will be used for bridges.

The resulting program will maintain a high level of Federal funding for bridges of most concern to the Federal Government -- the Federal-aid primary system bridges, including those on the Interstate System. Other bridges will be eligible for Federal funds at about the same program level as before.

4. The FHWA should define priority need and set criteria for determining which bridges fall into that category.

The proposed changes in the Administration bill are only one step in establishing bridge priorities nationally. Another key step in setting national goals is focusing HBRRP funds on the most serious bridge deficiencies on the Federal-aid primary system.

The Secretary's Annual Reports over the last 6 years have generally shown increases in both the number of bridges eligible for replacement or rehabilitation under the HBRRP and the estimated cost of bringing all deficient highway bridges up to standard. This report again shows an increase in the cost estimate, with the largest increase for the primary system. The estimate to improve all deficient bridges to current standards is idealistic. In actuality, not all bridges on the list of eligible structures will ever be replaced or rehabilitated. As mentioned in Part I, it is not economically feasible or practical to improve all 243,917 bridges classified as deficient, nor is it necessary to do so from a safety standpoint. Therefore, the HBRRP should focus on improving the more deficient bridges and those with the most Federal interest.

One of the main objectives of the HBRRP is to remove from service those highway bridges most in danger of failure. A change in the administrative eligibility criteria could direct the bulk of HBRRP funds toward improvement of bridges with structural inadequacies. Ideally, from a national perspective, the change in eligibility criteria would, at the same time, limit the number of low-volume bridge projects developed primarily to widen or improve roadway alignment of bridges that are adequate structurally.

In view of these considerations, the FHWA is reviewing the definition of "deficiency" used to establish program eligibility. The purpose is to determine if the factors now used to classify bridges as deficient are appropriate or whether they should be revised to concentrate funding more on structural than geometric inadequacies. A change in definition would mean geometric deficiencies on low-volume bridges would have a lesser role in the Federal bridge program, with many geometric improvements having to be deferred. The primary effect of this change would be on bridges that, in all probability, would never be improved under the current HBRRP definitions in any event. These bridges would be reclassified as marginally acceptable, a more realistic status in the absence of structural deficiencies.

5. Revise HBRRP eligibility limits to provide a more realistic picture of attainable bridge conditions.

Any bridge that is deficient and has a sufficiency rating of 80 or less based on information from a bridge inspection report is eligible for inclusion in the HBRRP. All structures with a rating of 80 or less are eligible for rehabilitation, while those with a rating below 50 are also eligible for replacement, if

they are structurally deficient or functionally obsolete. For reasons noted in Part I, the FHWA recommends that States first consider rehabilitating bridges with ratings below 50, rather than simply schedule them for replacement, the more expensive alternative.

In general, the candidate selection list of 221,817 bridges is too long. In particular, the list includes 51,040 bridges rated deficient only because of geometrics while having sufficiency ratings of 50 to 80, meaning they are eligible for rehabilitation. However, because these bridges are not dangerous from a structural standpoint, they are good candidates for cost-effective traffic control devices, rather than rehabilitation. Accordingly, the exclusion of functionally obsolete bridges from the HBRRP would be a reasonable condition. However, the law establishing the HBRRP makes it clear that Congress intends that at least a portion of the functionally obsolete bridges be included in the program. The extent of a possible criteria change is under review.

Further, recent experience in innovative but proven bridge rehabilitation techniques suggests that replacement eligibility criteria should be tightened to ensure more bridges are rehabilitated rather than replaced. This change would result in a much more cost-effective use of HBRRP funds because more bridges could be improved at a faster rate.

One option under consideration is reducing the sufficiency rating establishing eligibility for replacement and rehabilitation to, for example, 45 or less and 60 or less, respectively. Such a change would affect primarily bridges with a lower priority for improvement.

Because the current sufficiency rating criteria is an administrative threshold, the FHWA could change the rating criteria administratively without changes in regulations or Title 23, U. S. Code. The goal would be to remove the more deficient bridges from service.

6. Guidelines should be issued by Washington Headquarters defining in more detail the limits permitted on HBRRP projects, both for the length of approach and the amount of funds.

The current HBRRP regulations allow funding of only the minimum road improvements necessary to build the bridge. However, without a definition of "minimum," wide variations exist in the interpretations of this provision.

The 1984 management review found that in some instances approach roadway costs associated with HBRRP projects are excessive to the point of not falling within the intent of the program -- namely improving deficient bridges. Data also showed that overall, nonbridge costs were excessive in some instances. These findings indicated that additional guidelines would be beneficial and provide for more uniform use of HBRRP funds for approach roadway construction.

On August 29, 1985, the FHWA Washington Headquarters sent a memorandum to the agency's field offices directing them to evaluate this aspect of the program to increase the use of HBRRP funds for bridges. The memorandum established a specific nationwide goal of reducing the amount of HBRRP funds used on approach roadways. The effect of this goal will be an

increase in the percentage of HBRRP funds used on bridges. The memorandum directed the FHWA field offices to encourage the States and local entities to use other categories of funds for approach roadways and incidental nonbridge items.

7. Establish a policy that new bridges built to less than AASHTO standards will not be counted as deficient, appear on a selection list of eligible bridges, or be considered in calculating apportionment factors.

The FHWA has adopted AASHTO's A Policy on Geometric Design of Highways and Streets, 1984, for use on Federal-aid projects. The minimum standards for new and rehabilitated bridges included in the policy represent the minimum acceptable standards that will safely serve the public over the life of the highway system.

Generally, spending public funds to build substandard bridges is a poor investment. However, in some cases, applying even the minimum standards may not be appropriate or necessary. When this is the case, the State may ask the FHWA for a waiver of the AASHTO standards on a project-by-project basis. There are no mandatory standards for local system bridge projects built without Federal-aid funds. As a result, these projects are often built to standards less than the AASHTO minimum.

The 1984 management review found that many newly built or rehabilitated bridges are still classified as deficient because they were built to less than AASHTO standards. Because public entities will not build a new bridge knowing it is unsafe, these bridges must be considered as meeting the minimum requirements of the system they are on and should be rated and evaluated accordingly. Where a decision is made to construct to less than

AASHTO standards, an obvious judgment is made that the bridge will meet minimum acceptable service requirements. It should not be classified as deficient as a result of that decision.

Based on this understanding, the FHWA issued a policy memorandum on May 6, 1985, establishing that bridges in the NBI with a date of construction or major reconstruction within the past 10 years will not be considered deficient, will not be eligible for HBRRP funds, and will not be considered in calculations for the apportionment of HBRRP funds. This policy affected 17,967 bridges.

8. Retain the current apportionment formula for those systems that continue to have Federal involvement.

The Administration's bill proposes continuation of the current procedure for apportioning HBRRP funds (page 3). The FHWA, though, will continue to review the procedures for possible improvement in the equitable distribution of authorized program funds.

9. The FHWA should include certification by the National Institute for Certification of Engineering Technologies (NICET) in the next revision to NBIS regulations as an alternative minimum for meeting team leader or inspector qualifications.

The NBIS has set minimum qualifications for the individual in overall charge of the inspection program and the bridge inspection team leaders. Bridge inspectors do not have to meet any minimum qualifications under the NBIS.

One method of ensuring greater compliance with the NBIS would be to include bridge inspector certification for both inspectors and team leaders. For example, the National Society of Professional Engineers sponsors a certification program through the NICET. Under this program, technicians can take tests that, combined with their work experience, will establish their competence in various work categories associated with the role of technicians in government. To date, NICET programs have been established for a number of highway-related disciplines.

The FHWA is working with NICET to establish a certification for bridge inspectors. The process, which should be completed soon, will provide a means for inspectors to be certified nationally as competent in bridge inspection.

If the completed process is compatible with present requirements, the FHWA will issue a Notice of Proposed Rulemaking to modify the NBIS to include the certification procedure. Other aspects of the NBIS will be evaluated at the same time.

10. Rescind use of the Structure Inventory and Appraisal (SI&A) short form.

The NBIS requires each State to prepare and maintain a bridge inventory of all bridges on public roads. Certain SI&A data must be collected and retained by the State for submission to FHWA as needed.

Originally, the inventory requirement covered only bridges on the Federal-aid system. When the 1978 STAA required the inventory and inspection of off-system bridges on public roads as well, the FHWA prepared an abridged SI&A sheet (short form) for the bridges to aid

the States and local governments in completing this task. Some States and local governments used the optional form to accelerate the collection of data.

The short form represented the minimum data needed for the initial inventory, inspection, classification, and ranking of bridges. However, the NBI data must be used for a variety of purposes consistent with management of a national bridge program. To monitor and evaluate the application of the NBIS and have reasonable assurance that all bridge owners are fulfilling their responsibilities with respect to bridge safety, the FHWA management review concluded that full SI&A sheet data clearly is needed for all bridges subject to the NBIS.

On March 29, 1985, the FHWA rescinded use of the abridged SI&A sheet and required the collection of the full SI&A sheet data on future inspections.

11. Expand the AASHTO Manual for Maintenance Inspection of Bridges to include more explicit instructions for the more critical portions of a bridge.

This manual sets out the guidelines for conducting bridge inspections to meet the requirements of the NBIS. While this manual offers general instructions for bridge inspections, it does not provide details on inspecting some bridge types.

The AASHTO manual was intended to be general, not specific, to provide discretion for the bridge owner and rating agency. The result is some variation in inspections because portions of the inspection and

evaluations are subjective. Some officials have suggested that more explicit instructions, including examples, should be provided for the more critical portions of a bridge, not only for uniformity, but also for thoroughness.

The FHWA will encourage AASHTO to expand the manual to include more explicit guidance.

12. The FHWA should encourage and assist the States to develop their own bridge program management systems for planning, budgeting, and priority decisions as well as to get the most benefit out of bridge expenditures.

The magnitude of the bridge replacement and rehabilitation problem is quantified in this report to Congress. It is obvious that the total financial resources of Federal, State and local governments are not sufficient to meet present and ensuing bridge replacement and rehabilitation needs. Inevitably, transportation officials will be required to make serious trade-offs. It will require the utmost resourcefulness to ensure that bridges are safe, properly maintained and that the original investment is protected. Since this cannot be accomplished totally within the bridge replacement and rehabilitation program, new ways must be found to improve efficiency, cost effectiveness, and especially, to prolong the service life of existing bridges.

Managing a successful bridge program requires that enough facts are assembled and evaluated to allow bridge projects to be developed by priority and funds to be used most efficiently. An organized system for bridge inspecting, inventory, data gathering, and data analyses is needed.

The nucleus of any management system would include a bridge inventory. To be effective, the inventory must be complete, accurate, uniformly evaluated, and current. The bridge management system will use the inventory data along with load posting, policy, and maintenance needs. The result will be the basis for making replacement, rehabilitation, and maintenance decisions.

The FHWA has concluded through program reviews that States need to be more organized in their efforts to manage their orograms and to deal with impending problems. Presently, only about one-half of the States have formal written procedures for determining priorities in selecting bridge projects, and no State has a comprehensive bridge management program. Bridge maintenance programs, which are fully State funded and managed, are not optimally managed in most States. In fact, only a dozen or so States keep track of bridge maintenance activities and their costs.

While these facts are disturbing, there are encouraging signs:

1. One outstanding example is the recent work by one State to develop an advanced integrated bridge management system aimed at achieving optimal cost effectiveness in selecting and prioritizing bridge improvements, monitoring performance and accomplishing efficient load rating and routing of permit overloads. The system, when fully implemented, has the potential for affecting large savings not only in agency costs but in user costs as well.
2. Another recent example was a truck weight survey make by one State which led to the development of a level of service system whereby service criteria is selected at individual bridge sites based on functional

classification and highway use. Adoption of this flexible system has made possible large cost cuts in the States bridge program with little impact to highway users.

3. Yet another State has developed a system level bridge management model for selecting optimal bridge improvement strategies based on life cycle cost. While this early effort lacks refinement, it demonstrates the potential for greatly improved information based decision making both at the State and Federal level.

Because of the great potential for bridge management systems, the FHWA is formulating a demonstration project to present various system approaches to the States. This demonstration project, which will be available in 1986, will allow State and local governments to evaluate various systems in use and adopt the portions that have the greatest potential for meeting their individual needs. All State and local government agencies interested in improving the management of their bridge programs will be able to benefit from this demonstration project.

A bridge management system will be just as important with the adoption of the block grant program for urban, secondary and off-system bridges. A State or local government still must manage its total bridge program to determine the best use of available funds whether they be from Federal, State or local sources. Better utilization of funds on local system bridges will provide more funds for Federal interest bridges. The bridge management system, when

implemented, will establish both priority and timeliness for maintenance, rehabilitation, replacement or removal activities. Estimation of future accruing needs will also be a part of a total management system.

In addition, the National Cooperative Highway Research Program has begun a project to define a model "umbrella" bridge management system that could be used by others as a guide. This project will complement the FHWA demonstration project by providing additional techniques and system approaches to what is currently known about comprehensive bridge management systems.

These projects emphasize the importance of bridge management systems, which can help State and local officials use all funds and resources as efficiently and cost effectively as possible. The FHWA believes the development of bridge management systems is so important that it has been made a program emphasis area for FY 1986.

13. The FHWA Bridge Division should review the NBI and the coding guide for revisions to reflect changes in the program and ensure compatibility with other data collection systems.

The FHWA last updated the coding guide for the SI&A data of the Nation's bridges in 1979. Since then, changes have occurred in the need for data.

Also, several items in the coding guide conflict with information collected for other studies. This variation of data precludes use of records from the NBI to supplement other information collection systems.

Since 1979, the FHWA Bridge Division has maintained a file of suggested revisions from various sources. These comments and recommendations have been tabulated and will serve as a starting point. The Bridge Division has also asked other FHWA offices and the States for suggestions to improve SI&A data collection. A review of these comments has begun.

Any changes to NBI data, such as increasing the size of data fields, to make the information compatible with data from other sources will require a major effort by both the FHWA and the States. The FHWA will work with AASHTO, the States, local governments and other interested parties to revise and update the coding guide to reduce conflict in data collected by others and to meet new data needs.

14. The FHWA should continue developing a manual for inspection of fracture critical bridge details.

Some tension components of a bridge are fracture critical. Their failure would be expected to cause the bridge to collapse. Because of the danger of collapse, the close inspection of fracture critical bridge members is especially important. The catastrophic collapse of the Mianus River Bridge in Connecticut in 1983 focused renewed attention on inspection of fracture critical bridges and their components.

Under contract to the FHWA, a consultant is developing a supplement to the Bridge Inspector's Training Manual for Inspection of Fracture Critical Bridge Members. The manual will be published in 1986.

15. The FHWA should continue to emphasize the importance of the frequency and the depth of inspection.

Two factors affecting the extent of inspections are depth and frequency.

a. Depth. The depth of an inspection involves the degree of detail. The degree is determined by such factors as structure type, age, traffic characteristics, state of maintenance, and known deficiencies. Relatively new bridges, for example, may not require intensive inspection while older structures may require inspection in considerable detail. The individual in charge of the inspection program is responsible for determining the depth of the inspections to be conducted. Most States do not have written procedures for adjusting the depth of inspection to the condition of the bridge.

b. Frequency. The NBIS requires that each bridge on public roads be inspected at regular intervals, not to exceed 2 years. State and local governments may inspect individual bridges more often in view of known structural deficiencies.

Because of the importance of these two items, they are a continuing topic of discussion with the States. The FHWA maintains contacts in the form of reviews, meetings, and memorandums and through computer listings of the States' bridge inspection data. This frequent contact and emphasis will continue.

16. The FHWA should continue to provide technical and program assistance.

The bridge program is an active and highly visible program. Because of the activity, officials at all levels of the FHWA often discuss program matters with State agencies. For example, field reviews provide a chance for the FHWA and State officials to discuss and resolve existing or potential problems as well as to review good practices that might benefit other States. Both the FHWA field offices and Washington Headquarters staff are invited to National meetings and participate when possible. The FHWA also is searching continually for ideas on new publications and training material or revisions to existing material that would improve the overall bridge program. All of these activities will continue.

17. The FHWA should continue encouraging the States to enter their revised inventory data within the specified 90 days.

One section of the NBIS requires that inventory data on newly completed structures or modification of existing structures that would alter previously recorded data shall be entered in the State's records within 90 days. This part of the regulation has sometimes been overlooked, particularly at the local level. Consequently, because State records on upgraded bridges are sometimes not promptly updated, some NBI data is not correct.

The FHWA will continue to stress this requirement to the States and local governments in meetings and program reviews.

Summary

The 1984 bridge program management review identified several areas where improvements could be made. Proposed improvements varied from continued emphasis on specific items and clarification of other items to increased efforts to bring about compliance with the governing regulations. In all, the review resulted in 17 recommendations. The FHWA has already implemented some of these recommendations and will continue to work on the others.

Implementing these recommendations would result in a number of benefits.

1. The list of bridges eligible for the HBRRP (under new criteria) would present a more realistic picture of priority bridge needs, and progress would be more easily measured.

2. Bridge program funds would be directed to the more structurally inadequate bridges.

3. The NBI data would be more complete and useful following changes in coding and data collection forms.

4. Uniformity in bridge inspections and NBI data would be easier to achieve.

TABLE 1A

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATUS OF FUNDS PROVIDED FOR
BRIDGE REPLACEMENT & REHABILITATION MANDATORY 65% ON-SYSTEM - 118

AS OF DECEMBER 31, 1985

STATE	TOTAL AVAILABLE	OBLIGATIONS DURING FY 86	OBLIGATIONS TOTAL TO DATE	UNOBLIGATED BALANCE
ALABAMA	110,861,782.00	9,862,725.00	97,379,777.35	13,482,004.65
ALASKA	14,921,235.00		7,382,023.56	7,539,211.44
ARIZONA	14,921,235.00		8,403,134.32	6,518,100.68
ARKANSAS	107,438,780.00	4,737,643.00	84,777,802.00	22,661,978.00
CALIFORNIA	164,416,606.00	15,755,681.00	137,899,364.16	26,517,241.84
COLORADO	53,203,412.00	8,364,338.65	48,456,316.25	4,747,395.75
CONNECTICUT	87,736,736.00	3,217,330.24	63,912,087.76	23,796,620.24
DELAWARE	14,921,235.00	1,699,520.00	13,623,440.49	1,297,794.51
FLORIDA	139,279,062.00	31,709,415.00	138,902,892.00	376,170.00
GEORGIA	134,490,085.00	11,843,711.26	119,488,340.34	15,001,744.66
HAWAII	17,275,286.00	148,100.00	12,084,661.92	5,190,624.08
IDAHO	25,229,152.00	35,580.00	21,385,285.24	3,843,866.76
ILLINOIS	299,699,730.00	3,727,684.06	264,142,953.21	35,556,776.79
INDIANA	119,428,797.00	2,543,989.51	96,632,072.90	23,796,724.10
IOWA	149,961,179.00	12,299,944.92	123,597,295.10	25,803,883.90
KANSAS	105,571,747.00	6,960,273.21	116,754,697.73	48,817,049.27
KENTUCKY	147,317,539.00	9,928,689.59	138,183,663.50	9,133,875.50
LOUISIANA	219,049,229.00	631,505.25	192,617,897.25	27,231,331.75
MAINE	32,263,765.00	36,618.24	25,036,934.83	7,226,830.17
MARYLAND	109,570,073.00	18,593,680.00	95,330,547.00	14,239,526.00
MASSACHUSETTS	136,310,046.30	232,734.59CR	73,498,260.45	62,812,385.55
MICHIGAN	86,419,594.00	193,328.59CR	60,606,211.18	25,534,382.82
MINNESOTA	132,995,541.00	1,938,705.57	107,001,142.68	25,994,398.32
MISSISSIPPI	106,348,098.00	2,866,797.00	87,067,997.00	19,280,099.00
MISSOURI	215,642,953.00	6,862,507.56	167,262,028.04	48,380,924.96
MONTANA	38,957,550.00	389,513.00	25,020,844.15	13,936,705.85
NEBRASKA	132,035,934.00	3,132,582.16	85,167,435.70	16,868,498.30
NEVADA	14,921,235.00	36,582.00	8,307,287.00	6,614,148.00
NEW HAMPSHIRE	46,634,472.00	2,628,885.36	34,378,218.81	12,256,253.19
NEW JERSEY	231,179,166.00	15,043,881.20	152,588,428.57	78,590,737.43
NEW MEXICO	22,241,877.00	5,745.88CR	15,745,599.34	6,496,282.66
NEW YORK	556,339,309.00	44,971,478.00	484,177,250.00	72,161,759.00
NORTH CAROLINA	179,426,320.00	2,446,869.00	137,441,116.00	41,985,204.00
NORTH DAKOTA	33,453,804.00	229,278.53	26,811,555.65	6,642,148.35
OHIO	170,270,827.00	7,158,487.00	124,318,472.00	45,952,355.00
OKLAHOMA	106,359,574.00	2,882,252.08CR	62,157,669.91	44,201,904.09
OREGON	59,725,532.00	108,360.74CR	44,823,628.47	14,902,103.53
PENNSYLVANIA	366,417,717.00	52,862,528.09	340,112,718.24	26,304,998.76
RHODE ISLAND	21,853,397.00	803,257.27	14,620,377.17	7,232,719.83
SOUTH CAROLINA	67,880,203.00	1,033,645.43	42,667,830.60	25,212,372.40
SOUTH DAKOTA	30,178,833.92	40,591.00CR	18,784,388.78	11,394,445.14
TENNESSEE	213,118,574.00	10,637,205.30	174,479,146.02	38,648,428.30
TEXAS	251,690,795.00	2,981,668.65	137,342,613.06	114,348,781.94
UTAH	14,921,235.00	1,561,908.87	13,334,799.51	1,586,435.49
VERMONT	92,498,742.00	1,632,853.65	24,172,909.52	18,305,792.48
VIRGINIA	133,860,274.00	9,578,411.75	121,758,122.05	12,102,151.95
WASHINGTON	134,887,128.00	1,780,617.46	99,895,693.97	34,991,724.03
WEST VIRGINIA	111,457,341.00	9,855,587.00	67,996,207.00	43,461,134.00
WISCONSIN	135,887,874.00	9,536,407.43	97,677,915.62	38,209,958.38
WYOMING	14,921,235.00	112,600.00	10,765,441.00	4,155,794.00
DIST. OF COL.	48,211,588.00	417,001.44CR	22,927,681.56	25,283,906.44
PUERTO RICO	18,430,445.00	224,453.47	11,144,166.68	9,286,278.32
TOTAL	5,966,223,788.92	320,305,195.22	4,693,810,027.42	1,272,413,761.50

TABLE 1B

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATUS OF FUNDS PROVIDED FOR
BRIDGE REPLACEMENT & REHABILITATION MANDATORY 15% OFF-SYSTEM - 117

AS OF DECEMBER 31, 1985

STATE	TOTAL AVAILABLE	OBLIGATIONS DURING FY 86	OBLIGATIONS TOTAL TO DATE	UNOBLIGATED BALANCE
ALABAMA	25,583,489.00	652,679.39	19,317,417.39	6,266,071.73
ALASKA	3,443,361.00		1,465,269.41	1,978,091.59
ARIZONA	3,443,361.00	55,562.06	2,632,757.13	810,603.87
ARKANSAS	24,793,560.00	81,344.06CR	19,944,807.00	4,848,753.00
CALIFORNIA	37,942,292.00	1,885,195.81	30,516,930.54	7,425,361.46
COLORADO	12,277,710.00	261,362.82CR	8,182,635.08	4,095,074.92
CONNECTICUT	20,240,309.00	145,252.26CR	6,903,176.68	13,336,332.32
DELAWARE	3,443,361.00	316,960.00	3,041,421.48	401,939.52
FLORIDA	32,141,322.00	673,179.00	25,974,599.60	6,166,723.00
GEORGIA	31,038,173.00	2,289,316.07	27,131,198.10	3,906,974.90
HAWAII	3,960,604.00		1,499,117.35	2,491,486.65
IDAHO	9,822,113.00	419,744.00	5,425,160.01	396,952.99
ILLINOIS	69,161,476.00	1,691,476.46	61,678,614.57	7,482,861.43
INDIANA	28,406,647.00	837,059.73	21,609,203.24	6,797,443.76
IOWA	34,477,194.00	4,812,667.95	32,516,866.99	1,960,327.01
KANSAS	38,268,864.00	1,641,286.96	27,569,891.15	9,698,972.85
KENTUCKY	33,996,356.00	3,748,827.42	33,914,960.05	81,387.95
LOUISIANA	50,734,430.00	4,462,849.89	46,661,633.65	2,072,804.35
MAINE	7,445,484.00	31,001.60CR	5,055,124.32	2,390,359.68
MARYLAND	25,265,400.00	17,917.00CR	16,123,333.00	9,162,067.00
MASSACHUSETTS	31,456,302.00	261,632.78	12,980,642.21	18,475,659.79
MICHIGAN	19,942,981.00	261,923.00	15,152,605.12	4,790,375.88
MINNESOTA	30,691,278.00	991,851.02	27,207,520.77	3,483,757.23
MISSISSIPPI	24,541,868.00	1,836,725.00	19,084,630.83	5,457,238.83
MISSOURI	49,763,758.00	3,452,129.55	36,230,746.15	19,533,011.85
MONTANA	8,990,204.00	454,139.00CR	6,830,860.24	2,159,403.76
NEBRASKA	23,540,754.00	1,072,906.91	19,992,042.64	3,548,711.36
NEVADA	3,443,361.00	64,717.00	2,475,130.00	968,231.00
NEW HAMPSHIRE	10,761,802.00	47,458.93	7,852,660.03	2,909,142.03
NEW JERSEY	53,349,039.00	617,437.31	14,133,764.92	39,215,274.08
NEW MEXICO	5,132,742.00	96,424.89	3,987,283.24	1,145,458.76
NEW YORK	128,385,927.00	4,368,691.00	105,723,155.00	22,662,772.00
NORTH CAROLINA	41,466,073.00	2,803,748.00	37,008,136.00	4,397,937.00
NORTH DAKOTA	7,720,109.00	453,677.66	6,807,975.49	912,133.51
OHIO	99,293,267.00	2,810,409.00	26,428,891.00	12,864,376.00
OKLAHOMA	20,544,518.00	1,725,640.80CR	7,552,083.68	16,992,434.32
OREGON	13,782,814.00	910,476.75	9,975,958.39	3,806,855.61
PENNSYLVANIA	84,557,936.00	3,870,997.69	62,062,402.98	22,495,533.32
RHODE ISLAND	5,072,423.29	340,841.41	3,929,303.28	1,143,120.01
SOUTH CAROLINA	15,664,662.00	334,150.27	12,195,971.57	3,468,690.43
SOUTH DAKOTA	6,581,925.00		4,151,877.43	2,430,047.57
TENNESSEE	49,181,209.00	3,259,550.00	35,868,098.00	13,313,111.00
TEXAS	98,082,491.00	2,172,674.06	82,015,178.55	16,067,312.45
UTAH	3,443,361.00	370,914.25	2,719,556.86	723,804.14
VERMONT	9,802,778.00	80,600.00	8,321,981.68	1,480,796.32
VIRGINIA	30,890,832.00	447,618.59	20,782,900.21	10,108,531.79
WASHINGTON	31,127,799.00	3,140,912.71	25,856,775.66	5,271,023.34
WEST VIRGINIA	25,720,924.00	4,804,609.00	22,256,755.00	3,464,169.00
WISCONSIN	31,358,738.00	1,367,936.46	24,025,263.07	7,333,474.93
WYOMING	3,443,361.00	430,504.30	3,141,706.00	301,655.00
DIST. OF COL.	1,261,855.00			1,261,855.00
PUERTO RICO	3,791,841.00	231,358.27	1,536,880.75	2,255,560.25
TOTAL	1,388,603,946.29	61,670,766.77	1,028,452,699.86	360,151,246.43

TABLE 1C

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATUS OF FUNDS PROVIDED FOR
BRIDGE REPLACEMENT & REHABILITATION MANDATORY 20% ON/OFF-SYSTEM - 119

AS OF DECEMBER 31, 1985

STATE	TOTAL AVAILABLE	OBLIGATIONS DURING FY 86	OBLIGATIONS TOTAL TO DATE	UNOBLIGATED BALANCE
ALABAMA	34,111,310.00	156,220.91	25,028,680.44	9,083,235.56
ALASKA	4,591,147.00		1,738,575.00	2,852,572.00
ARIZONA	4,591,147.00	49,684.30	3,021,041.44	1,570,105.56
ARKANSAS	33,958,078.00	212,932.00	24,083,505.00	8,994,573.00
CALIFORNIA	50,589,720.00	20,130.00CR	38,608,877.92	11,980,842.08
COLORADO	16,376,278.00	226,410.12CR	10,629,669.94	5,745,368.06
CONNECTICUT	26,986,675.00	95,389.13	17,721,513.19	9,265,161.81
DELAWARE	4,591,147.00	68,240.00	3,520,456.88	1,070,690.12
FLORIDA	42,855,395.00	178,253.00	29,719,882.00	13,136,213.00
GEORGIA	41,381,563.00	148,688.56CR	27,572,923.22	13,808,639.78
HAWAII	5,315,471.00	12,541.06CR	1,204,846.48	4,110,624.52
IDAHO	7,762,814.00	496,029.00	6,260,586.23	1,502,727.77
ILLINOIS	92,215,300.00	13,799.49	80,127,215.31	12,088,284.69
INDIANA	35,268,858.00	142,608.00	14,699,146.89	20,559,711.11
IOWA	45,989,590.00	436,541.43	37,413,368.66	8,576,221.34
KANSAS	50,945,152.00	536,521.62	41,762,137.76	9,183,014.24
KENTUCKY	45,328,469.00	3,642,407.71	43,880,441.89	1,448,027.11
LOUISIANA	67,645,915.00	65,498.04CR	58,959,881.86	8,686,233.14
MAINE	10,927,308.00	116,945.07	9,43[illegible],342.93	1,496,415.07
MARYLAND	39,167,790.00	449,178.00	18,555,135.00	18,612,655.00
MASSACHUSETTS	41,941,734.00	2,037,703.20	27,806,984.17	14,132,849.83
MICHIGAN	26,590,840.00	45,440.00	15,798,135.29	8,792,504.71
MINNESOTA	40,921,732.00	450,950.30CR	30,241,848.98	10,679,855.02
MISSISSIPPI	32,722,488.00	488,222.00	19,128,427.00	13,594,061.00
MISSOURI	66,351,676.00	648,860.53	45,966,599.37	20,384,976.63
MONTANA	11,986,936.00	819,210.00	7,639,287.55	4,347,648.45
NEBRASKA	31,395,672.00	523,946.34CR	24,738,538.72	6,657,331.28
NEVADA	4,591,147.00	15,986.00CR	1,622,548.00	2,968,599.00
NEW HAMPSHIRE	14,349,266.00	693,577.52	11,775,907.22	2,573,358.78
NEW JERSEY	71,132,350.00		23,126,369.63	48,005,980.63
NEW MEXICO	6,643,652.00	54,389.06CR	2,649,522.97	4,194,129.03
NEW YORK	171,181,234.00	6,755,608.00	141,895,292.63	29,286,142.03
NORTH CAROLINA	55,268,095.00	3,683,803.30	46,427,212.00	8,780,883.00
NORTH DAKOTA	10,293,475.00	83,528.68CR	8,337,130.69	1,956,344.31
OHIO	52,391,020.00	23,509.00CR	17,898,518.03	34,492,502.00
OKLAHOMA	32,726,020.00	387,993.20	15,341,294.49	17,384,725.51
OREGON	18,377,084.00	232,223.22	9,874,002.88	8,503,081.12
PENNSYLVANIA	112,743,909.00	3,293,341.33	89,718,542.54	23,025,366.46
RHODE ISLAND	6,578,938.90		3,529,299.44	3,049,639.46
SOUTH CAROLINA	20,886,213.00	40,612.91	15,964,665.55	4,921,547.45
SOUTH DAKOTA	8,775,897.00	26,278.00CR	5,997,357.85	2,778,539.15
TENNESSEE	60,574,995.00	1,159,798.00	51,552,292.00	14,022,703.00
TEXAS	77,443,322.00	619,245.38	43,207,209.89	34,236,112.11
UTAH	4,591,147.00	807,591.02	4,497,670.02	93,476.98
VERMONT	13,070,369.00	116,450.88	9,186,219.79	3,884,153.21
VIRGINIA	41,187,775.00	534,168.86	34,093,921.28	7,093,853.72
WASHINGTON	41,503,730.00	153,050.33CR	28,614,094.76	12,889,635.24
WEST VIRGINIA	34,294,565.00	2,023,640.00	21,549,498.00	12,745,067.00
WISCONSIN	41,811,652.00	1,784,696.63	28,163,714.17	13,647,937.83
WYOMING	4,591,147.00		3,614,379.00	976,768.00
DIST. OF COL.	24,668,229.00	183,272.20	12,153,741.92	12,514,527.08
PUERTO RICO	10,324,075.00	5,919.24	1,690,279.73	8,633,795.83
TOTAL	1,352,692,435.90	31,150,904.05	1,301,662,376.46	551,030,059.44

TABLE 1D

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATUS OF FUNDS PROVIDED FOR
BRIDGE REPLACEMENT DISCRETIONARY FUNDS - 119

AS OF DECEMBER 31, 1985

STATE	TOTAL AVAILABLE	OBLIGATIONS DURING FY 86	OBLIGATIONS TOTAL TO DATE	UNOBLIGATED BALANCE
ALABAMA	98,517,470.00	2,014,358.80	50,134,828.80	48,382,641.20
ALASKA	20,369,305.26		20,369,305.26	
ARIZONA				
ARKANSAS				
CALIFORNIA	78,766,779.46		74,206,779.46	4,560,000.00
COLORADO	51,617,551.00		51,617,551.00	
CONNECTICUT				
DELAWARE	15,171,082.10		15,171,082.10	
FLORIDA	6,928,632.00		6,928,632.00	
GEORGIA	23,000,000.00		23,000,000.00	
HAWAII				
IDAHO	18,299,943.00		18,299,943.00	
ILLINOIS	128,505,455.00	26,894,690.28	124,673,945.28	3,831,509.72
INDIANA				
IOWA	48,226,107.42	165,590.36	46,489,778.86	1,736,328.56
KANSAS	31,247,884.72		31,247,884.72	
KENTUCKY				
LOUISIANA	6,672,000.00		5,552,000.00	1,120,000.00
MAINE	8,600,000.00		7,400,000.00	1,200,000.00
MARYLAND	28,633,000.00		17,433,000.00	11,200,000.00
MASSACHUSETTS	60,000.00		60,000.00	
MICHIGAN	32,646,120.00		32,646,120.00	
MINNESOTA	28,996,342.72	14,799,000.00	27,566,342.72	1,430,000.00
MISSISSIPPI	56,653,279.00		54,453,279.00	2,200,000.00
MISSOURI	64,085,679.94		62,441,689.26	1,643,990.68
MONTANA	2,736,000.00		2,736,000.00	
NEBRASKA	10,755,885.96		10,604,705.96	151,680.00
NEVADA				
NEW HAMPSHIRE	4,900,000.00			4,900,000.00
NEW JERSEY	28,988,598.00		28,988,598.00	
NEW MEXICO				
NEW YORK	223,367,110.00	49,280,000.00	212,767,110.00	10,600,000.00
NORTH CAROLINA	8,993,012.00		8,993,012.00	
NORTH DAKOTA	12,800,000.00		12,800,000.00	
OHIO	61,749,395.00		61,550,091.00	199,304.00
OKLAHOMA				
OREGON	16,694,197.00		16,694,197.00	
PENNSYLVANIA	118,420,749.00		118,420,723.00	26.00
RHODE ISLAND	43,810,000.00		43,810,000.00	
SOUTH CAROLINA	45,872,679.72	192,348.46	33,865,328.12	12,007,651.60
SOUTH DAKOTA				
TENNESSEE	35,282,632.00		35,282,632.00	
TEXAS	8,400,000.00		8,400,000.00	
UTAH				
VERMONT	10,256,110.00		10,256,110.00	
VIRGINIA	41,727,764.22		29,727,764.22	12,000,000.00
WASHINGTON	73,108,669.68		73,108,569.68	
WEST VIRGINIA	43,062,000.00		42,562,000.00	500,000.00
WISCONSIN	56,037,961.00		54,607,961.00	1,430,000.00
WYOMING				
DIST. OF COL.	17,860,000.00		17,860,000.00	
PUERTO RICO				
SUBTOTAL	1,590,006,693.23	93,013,607.16	1,470,913,571.44	119,093,121.79
UNALLOCATED	9,993,306.80			
TOTAL	1,600,000,000.00			

TABLE 1E

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATUS OF FUNDS PROVIDED FOR
ACCELERATION OF BRIDGE PROJECTS - 116

AS OF DECEMBER 31, 1985

STATE	TOTAL AVAILABLE	OBLIGATIONS DURING FY 86	OBLIGATIONS TOTAL TO DATE	UNOBLIGATED BALANCE
ALABAMA				
ALASKA				
ARIZONA				
ARKANSAS				
CALIFORNIA				
COLORADO				
CONNECTICUT				
DELAWARE				
FLORIDA				
GEORGIA				
HAWAII				
IDAHO				
ILLINOIS				
INDIANA				
IOWA				
KANSAS				
KENTUCKY	$7,874,304.00		$1,996,323.76	$5,877,980.24
LOUISIANA				
MAINE				
MARYLAND				
MASSACHUSETTS				
MICHIGAN				
MINNESOTA				
MISSISSIPPI				
MISSOURI				
MONTANA				
NEBRASKA				
NEVADA				
NEW HAMPSHIRE				
NEW JERSEY				
NEW MEXICO				
NEW YORK				
NORTH CAROLINA				
NORTH DAKOTA				
OHIO				
OKLAHOMA				
OREGON				
PENNSYLVANIA				
RHODE ISLAND				
SOUTH CAROLINA				
SOUTH DAKOTA				
TENNESSEE				
TEXAS				
UTAH				
VERMONT				
VIRGINIA				
WASHINGTON				
WEST VIRGINIA	45,334,115.00		38,279,279.00	7,054,836.00
WISCONSIN				
WYOMING				
DIST. OF COL.				
PUERTO RICO				
SUBTOTAL	113,208,119.00		90,276,102.76	22,932,016.24
UNALLOCATED	86,617,881.00			
TOTAL	$199,826,000.00			

TABLE 2A

STATUS OF BRIDGES APPROVED FOR THE BRIDGE PROGRAMS
MANDATORY 65 PERCENT ON-SYSTEM - 118
AS OF DECEMBER 31, 1985

	BRIDGES BEING PREPARED FOR CONSTRUCTION	BRIDGES UNDER CONSTRUCTION	BRIDGES COMPLETE	TOTAL
ALABAMA	359	99	89	547
ALASKA	0	1	9	10
ARIZONA	0	4	8	12
ARKANSAS	29	146	97	272
CALIFORNIA	118	69	108	295
COLORADO	50	19	53	122
CONNECTICUT	21	47	13	81
DELAWARE	6	4	3	13
DIST. OF COL.	11	3	2	16
FLORIDA	50	41	38	129
GEORGIA	191	159	146	496
HAWAII	5	0	5	10
IDAHO	39	15	35	89
ILLINOIS	81	135	416	632
INDIANA	19	31	80	130
IOWA	177	93	273	543
KANSAS	158	68	177	403
KENTUCKY	75	92	136	303
LOUISIANA	34	48	152	234
MAINE	16	11	23	50
MARYLAND	17	38	26	81
MASSACHUSETTS	20	25	25	70
MICHIGAN	8	33	98	139
MINNESOTA	17	31	172	220
MISSISSIPPI	38	117	92	247
MISSOURI	213	51	128	392
MONTANA	64	19	18	101
NEBRASKA	87	70	210	367
NEVADA	14	10	6	30
NEW HAMPSHIRE	37	8	25	70
NEW JERSEY	93	15	23	131
NEW MEXICO	1	2	30	33
NEW YORK	287	112	188	587
NORTH CAROLINA	183	56	69	308
NORTH DAKOTA	8	25	73	106
OHIO	86	116	199	401
OKLAHOMA	2	51	12	65
OREGON	86	37	50	173
PENNSYLVANIA	172	149	25	346
RHODE ISLAND	14	4	4	22
SOUTH CAROLINA	37	22	52	111
SOUTH DAKOTA	25	38	57	120
TENNESSEE	147	192	285	624
TEXAS	18	38	215	271
UTAH	20	8	21	49
VERMONT	65	8	41	114
VIRGINIA	36	28	86	150
WASHINGTON	35	19	68	122
WEST VIRGINIA	97	41	24	162
WISCONSIN	182	35	219	436
WYOMING	1	25	15	41
PUERTO RICO	0	2	4	6
TOTALS	3549	2510	4423	10482

TABLE 2B

STATUS OF BRIDGES APPROVED FOR THE BRIDGE PROGRAMS
MANDATORY 15 PERCENT OFF-SYSTEM - 117
AS OF DECEMBER 31, 1985

	BRIDGES BEING PREPARED FOR CONSTRUCTION	BRIDGES UNDER CONSTRUCTION	BRIDGES COMPLETE	TOTAL
ALABAMA	7	144	151	302
ALASKA	1	0	2	3
ARIZONA	0	2	17	19
ARKANSAS	2	22	64	88
CALIFORNIA	59	18	57	134
COLORADO	22	7	5	34
CONNECTICUT	10	2	6	18
DELAWARE	7	10	4	21
DIST. OF COL.	0	0	0	0
FLORIDA	55	24	32	111
GEORGIA	86	97	103	286
HAWAII	2	2	2	6
IDAHO	23	4	20	47
ILLINOIS	48	80	556	684
INDIANA	34	15	49	98
IOWA	58	44	207	309
KANSAS	8	70	126	204
KENTUCKY	38	58	59	155
LOUISIANA	115	92	156	363
MAINE	6	2	31	39
MARYLAND	19	18	22	59
MASSACHUSETTS	4	7	2	13
MICHIGAN	6	10	61	77
MINNESOTA	12	22	221	255
MISSISSIPPI	8	47	79	134
MISSOURI	260	47	58	365
MONTANA	39	6	13	58
NEBRASKA	118	50	86	254
NEVADA	6	2	8	16
NEW HAMPSHIRE	16	1	17	34
NEW JERSEY	63	8	2	73
NEW MEXICO	0	2	14	16
NEW YORK	171	35	77	283
NORTH CAROLINA	87	34	49	170
NORTH DAKOTA	0	19	44	63
OHIO	12	46	100	158
OKLAHOMA	0	14	4	18
OREGON	54	16	43	113
PENNSYLVANIA	81	97	26	204
RHODE ISLAND	6	2	6	14
SOUTH CAROLINA	30	23	30	83
SOUTH DAKOTA	0	11	36	47
TENNESSEE	163	55	39	257
TEXAS	48	47	148	235
UTAH	11	2	17	30
VERMONT	4	5	51	60
VIRGINIA	11	17	75	103
WASHINGTON	53	24	77	154
WEST VIRGINIA	44	25	13	82
WISCONSIN	102	43	45	370
WYOMING	12	2	8	22
PUERTO RICO	0	0	2	2
TOTALS	2093	1430	3220	6743

TABLE 2C

STATUS OF BRIDGES APPROVED FOR THE BRIDGE PROGRAMS
OPTIONAL 20 PERCENT ON/OFF-SYSTEM - 114
AS OF DECEMBER 31, 1985

	BRIDGES BEING PREPARED FOR CONSTRUCTION	BRIDGES UNDER CONSTRUCTION	BRIDGES COMPLETE	TOTAL
ALABAMA	39	59	56	154
ALASKA	8	1	2	11
ARIZONA	1	5	5	11
ARKANSAS	11	18	39	68
CALIFORNIA	43	29	28	100
COLORADO	10	4	5	19
CONNECTICUT	6	1	1	8
DELAWARE	0	2	0	2
DIST. OF COL.	7	3	0	10
FLORIDA	5	17	9	31
GEORGIA	45	44	43	132
HAWAII	1	0	0	1
IDAHO	7	3	12	22
ILLINOIS	20	40	289	349
INDIANA	2	7	20	29
IOWA	30	97	258	385
KANSAS	13	68	102	183
KENTUCKY	38	56	79	173
LOUISIANA	33	69	50	152
MAINE	6	10	18	34
MARYLAND	0	7	5	12
MASSACHUSETTS	6	8	3	17
MICHIGAN	5	20	78	103
MINNESOTA	8	31	82	121
MISSISSIPPI	2	37	72	111
MISSOURI	19	23	29	71
MONTANA	30	14	10	54
NEBRASKA	4	22	67	93
NEVADA	8	0	3	11
NEW HAMPSHIRE	24	10	13	47
NEW JERSEY	18	4	1	23
NEW MEXICO	0	1	6	7
NEW YORK	46	26	56	128
NORTH CAROLINA	86	38	20	144
NORTH DAKOTA	0	22	36	58
OHIO	8	7	67	74
OKLAHOMA	0	13	7	20
OREGON	19	6	34	59
PENNSYLVANIA	10	25	6	41
RHODE ISLAND	1	1	0	2
SOUTH CAROLINA	11	15	46	72
SOUTH DAKOTA	1	17	27	45
TENNESSEE	34	56	169	259
TEXAS	4	43	24	71
UTAH	3	3	12	18
VERMONT	29	1	26	56
VIRGINIA	22	8	48	78
WASHINGTON	19	9	9	37
WEST VIRGINIA	19	13	6	38
WISCONSIN	106	51	123	280
WYOMING	8	6	5	19
PUERTO RICO	1	0	3	4
TOTALS	868	1070	2109	4047

TABLE 3

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1985

STATE	BRIDGE	Allocations Approved (IN MILLIONS) FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986
Alabama	Cochrane	$ 0.608	$ 1.200	$ 1.520			$ 6.735	$ 30.102	$ 50.397
	Claiborne-Murphy				$ 0.640	$ 7.315			
Alaska	Gastineau A Kowee Cr.	20.369							
California	Golden Gate	1.000	2.549	15.300	26.012	10.200			4.560
	San Mateo		0.720	4.000	1.649				
	Russian Rv. @ Preston					0.520	0.200	1.957	
	Mission Bay Channel							10.100	
Colorado	Colfax-Larimer Viaduct				6.080	13.628	13.290	18.820	
Delaware	Augustine Cutoff		6.007						
	US 113 over St. Jones River				9.164				
Dis. of Col.	Key Bridge				0.500	1.360		16.000	
Florida	Barron Collier		8.928						
Georgia	Torras Causeway		1.600		19.400				
Idaho	Sandpoint	9.600							
	Bonners Ferry				8.173			0.527	

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TABLE 3 (cont.)

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1985

STATE	BRIDGE	Allocations Approved (IN MILLIONS) FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986
Illinois	Miss. Rv. @ Quincy	$ 0.400	$ 0.800	$ 1.360	$ 7.100	$ 26.200		$ 0.508	
	US 36 @ Florence	0.804						2.500	$ 29.030
	Pekin	11.400		3.100					
	Franklin St. Bridge					1.280			0.770
	LaSalle-Peru Bridge					10.380	$ 27.656		
	Staley Viaduct						1.200		0.960
Iowa/ Wisconsin	Eagle Point	5.600	23.700	0.053					
Iowa/ Illinois	Keokuk	0.360	0.440	7.856		10.193		2.687	0.400
Iowa/ Nebraska	Missouri Rv. @ Sioux City	2.723	0.397						
Iowa	MacArthur Bridge					0.500		0.047	0.772
Kansas/ Missouri	US 36/Mo. River	8.002	5.626	1.958	1.817				
Kansas	West Kansas Ave.					6.250	12.036		

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TABLE 3 (cont.)

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1985

STATE	BRIDGE	Allocations Approved (IN MILLIONS) FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986
Maine	Million Dollar	$ 0.400		$ 0.400				$ 0.160	$ 1.200
	Wiscasset-Edgecomb		$ 2.500	3.700		$ 0.240			
Maryland	South River		17.433						
	US 50-301/Severn								11.200
Mass.	Fore River	0.060							
Michigan	Third Street		1.824		$ 0.151		$ 19.911		
	MacArthur Bridge				10.720				
Minnesota	High Bridge						1.724	1.563	14.799
Mississippi	Natchez-Vidalia	1.680		8.000			13.157	22.400	3.320
	Escatawpa River						5.948		
	Fort Bayou Bridge					8.320	0.500		
Missouri	US 67	15.684	2.391						0.610
	US 54/Grand Glaize				6.185	0.794			
	ASB		8.620	0.478	3.261	10.862	5.500	3.300	1.000
Montana	Warden					2.736			
Nebraska/ Iowa	Nebraska City				0.565	8.015	1.355	1.040	0.480
New Hamp.	Notre Dame Bridge								4.900

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TABLE 3 (cont.)

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1985

STATE	BRIDGE	Allocations Approved (IN MILLIONS) FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986
New Jersey	Rte. 22WB/Waverly Yards				$ 0.480	$ 11.200			
	Pulaski Skyway						$ 15.200	$ 0.108	
New York	South Park Avenue	$ 7.671							
	Queensboro	1.335		$ 18.588	28.125	8.800	0.496	37.664	$ 7.080
	Manhattan	2.152			5.464	0.736	27.832	2.800	0.720
	Little Falls	3.050							
	Brooklyn					5.438	3.100		52.080
New York/ Vermont	Rouses Point			0.400	1.016			19.096	
North Car.	US 421/Cape Fear				8.993				
North Dak.	Bismarck Mem.			1.850	10.950				
Ohio	Northfield Rd. Br.					5.490			
	North Main St. Viaduct	18.400	$ 7.117						
	Main Ave. Bridge						3.615		
	Hopple St. Viaduct							7.127	

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TABLE 3 (cont.)

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1985

STATE	BRIDGE	Allocations Approved (IN MILLIONS) FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986
Oregon	Center Street	$ 0.720	$ 0.320	$ 15.400	$ 0.254				
Penn.	Bloomfield	2.880	6.640	8.640		$ 1.840	$ 5.800		
	Rochester-Monaca				2.400			$ 14.000	
	Passyunk Avenue	30.000							
	Minsi Trail				8.880		4.000		
	Beaver Falls		0.800	9.795					
	Monongahela Rv.					0.400	0.900	12.800	
	Towanda					1.000	7.645		
Rhode Is.	Jamestown	0.080	2.938		0.400	0.400	40.000		
South Car.	Hilton Head, Skull & Mackey Cr.	2.500	12.973						
	Sampit River		1.000	11.040					$ 0.200
	James Island			4.400	1.760				12.000
Tennessee	Sidney Lewis Br.					11.400			
	Walnut Street				14.028				
	Alvin York Br.						0.575	9.280	

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TABLE 3 (cont.)

HIGHWAY BRIDGE REPLACEMENT AND REHABILITATION PROGRAM
DISCRETIONARY FUNDING STATUS REPORT
As Of December 31, 1985

STATE	BRIDGE	Allocations Approved (IN MILLIONS) FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986
Texas	Brazos Rv. Div. Channel		$ 8.400						
Virginia	James River	$ 8.300	16.000	$ 0.075					
	Nansemond River	3.353							
	Robert E. Lee Br.					$ 2.000			
	Williams Viaduct								$ 12.000
Washington	Swinomish Channel	8.190	2.087	1.103					
	Pasco-Kennewick	1.729							
	West Seattle			60.000					
West Va./ Ohio	Weirton/ Steubenville				$ 8.000	18.062	$ 16.500		0.500
Wisconsin/ Minnesota	Arrowhead	13.320	31.820	7.868	3.657	2.300	0.492		
Wisconsin/ Minnesota	Wabasha Bridge								2.860
	TOTAL	$182.370	$174.830	$186.804	$195.824	$187.859	$235.367	$214.586	$211.038

TABLE 4A

COUNT OF DEFICIENT BRIDGES BY STATE
ON FEDERAL-AID SYSTEM
AS OF DECEMBER 31, 1985

	BRIDGES IN INVENTORY	NON-DEFICIENT BRIDGES	STRUCTURALLY DEFICIENT	FUNCTIONALLY OBSOLETE	DEFICIENT BRIDGES
ALABAMA	7,585	4,851	1,057	1,677	2,734
ALASKA	565	528	32	5	37
ARIZONA	4,427	4,182	68	177	245
ARKANSAS	5,893	3,846	368	1,679	2,047
CALIFORNIA	14,782	12,645	486	1,651	2,137
COLORADO	3,488	2,902	398	188	586
CONNECTICUT	2,616	957	561	1,098	1,659
DELAWARE	466	398	52	16	68
DIST. OF COL.	223	176	44	3	47
FLORIDA	5,818	4,671	122	1,025	1,147
GEORGIA	7,886	4,758	983	2,145	3,128
HAWAII	672	524	83	65	148
IDAHO	1,663	1,437	160	66	226
ILLINOIS	10,480	8,441	1,563	476	2,039
INDIANA	7,179	4,553	779	1,847	2,626
IOWA	7,077	5,002	831	1,244	2,075
KANSAS	10,699	7,252	905	2,542	3,447
KENTUCKY	4,884	2,713	263	1,908	2,171
LOUISIANA	5,661	4,003	838	820	1,658
MAINE	1,250	1,056	132	62	194
MARYLAND	2,496	1,740	387	369	756
MASSACHUSETTS	3,654	2,688	923	43	966
MICHIGAN	5,790	4,812	733	245	978
MINNESOTA	5,032	4,105	535	392	927
MISSISSIPPI	7,456	4,102	1,601	1,753	3,354
MISSOURI	8,701	5,234	1,866	1,601	3,467
MONTANA	2,557	1,081	109	1,367	1,476
NEBRASKA	5,093	3,884	694	515	1,209
NEVADA	772	668	12	92	104
NEW HAMPSHIRE	1,205	905	170	130	300
NEW JERSEY	4,100	2,832	809	459	1,268
NEW MEXICO	2,861	2,439	276	146	422
NEW YORK	8,949	4,185	4,041	723	4,764
NORTH CAROLINA	5,373	3,407	514	1,452	1,966
NORTH DAKOTA	1,687	1,205	146	336	482
OHIO	12,152	10,086	1,904	162	2,066
OKLAHOMA	7,945	5,214	1,005	1,726	2,731
OREGON	3,746	3,252	293	201	494
PENNSYLVANIA	10,903	7,677	2,479	747	3,226
RHODE ISLAND	566	469	74	23	97
SOUTH CAROLINA	4,213	3,425	216	572	788
SOUTH DAKOTA	2,759	2,287	236	236	472
TENNESSEE	7,244	4,267	1,276	1,701	2,977
TEXAS	25,201	20,622	980	3,599	4,579
UTAH	1,465	1,377	58	30	88
VERMONT	1,291	860	147	284	431
VIRGINIA	6,834	5,437	612	785	1,397
WASHINGTON	3,965	2,918	400	647	1,047
WEST VIRGINIA	3,398	1,785	1,155	458	1,613
WISCONSIN	6,280	3,656	1,941	683	2,624
WYOMING	1,896	1,774	33	89	122
PUERTO RICO	883	561	83	239	322
TOTALS	269,781	193,849	35,433	40,499	75,932

TABLE 4B

COUNT OF DEFICIENT BRIDGES BY STATE
OFF FEDERAL-AID SYSTEM
AS OF DECEMBER 31, 1985

	BRIDGES IN INVENTORY	NON-DEFICIENT BRIDGES	STRUCTURALLY DEFICIENT	FUNCTIONALLY OBSOLETE	DEFICIENT BRIDGES
ALABAMA	7,753	3,250	2,995	1,508	4,503
ALASKA	253	178	60	15	75
ARIZONA	803	654	90	59	149
ARKANSAS	7,244	2,970	1,196	3,078	4,274
CALIFORNIA	7,487	3,887	1,089	2,511	3,600
COLORADO	3,734	1,551	1,880	303	2,183
CONNECTICUT	1,146	449	340	357	697
DELAWARE	262	183	47	32	79
DIST. OF COL.	13	13	0	0	0
FLORIDA	4,197	2,723	603	871	1,474
GEORGIA	6,295	2,917	2,939	439	3,378
HAWAII	369	229	38	102	140
IDAHO	2,053	1,207	464	382	846
ILLINOIS	14,662	8,822	3,987	1,853	5,840
INDIANA	10,438	4,317	3,480	2,721	6,121
IOWA	18,975	8,456	5,310	5,209	10,519
KANSAS	15,046	4,987	4,884	5,175	10,059
KENTUCKY	7,587	2,873	1,353	3,361	4,714
LOUISIANA	8,401	3,574	3,168	1,659	4,827
MAINE	1,351	790	283	278	561
MARYLAND	1,891	1,163	248	480	728
MASSACHUSETTS	1,207	549	625	33	658
MICHIGAN	4,735	2,492	1,849	394	2,243
MINNESOTA	7,876	4,835	1,420	1,621	3,041
MISSISSIPPI	9,270	3,402	5,025	843	5,868
MISSOURI	15,095	3,341	4,919	6,835	11,754
MONTANA	2,334	756	526	1,052	1,578
NEBRASKA	11,001	2,891	6,407	1,703	8,110
NEVADA	255	181	29	45	74
NEW HAMPSHIRE	1,335	500	390	445	835
NEW JERSEY	1,775	1,000	482	293	775
NEW MEXICO	571	366	118	87	205
NEW YORK	8,491	2,157	5,441	893	6,334
NORTH CAROLINA	10,429	2,981	4,212	3,236	7,448
NORTH DAKOTA	3,731	1,307	1,913	511	2,424
OHIO	16,825	12,704	2,680	1,441	4,121
OKLAHOMA	14,877	5,389	7,078	2,410	9,488
OREGON	2,816	2,089	327	400	727
PENNSYLVANIA	11,179	6,566	3,159	1,454	4,613
RHODE ISLAND	133	84	32	17	49
SOUTH CAROLINA	4,670	3,610	727	333	1,060
SOUTH DAKOTA	4,292	1,358	1,514	1,420	2,934
TENNESSEE	11,103	5,065	4,617	1,421	6,038
TEXAS	18,546	6,812	6,636	5,098	11,734
UTAH	964	669	212	83	295
VERMONT	1,364	621	277	466	743
VIRGINIA	5,676	2,991	563	2,122	2,685
WASHINGTON	2,833	2,098	290	445	735
WEST VIRGINIA	3,261	1,005	1,655	601	2,256
WISCONSIN	6,608	3,003	2,468	1,137	3,605
WYOMING	942	421	269	252	521
PUERTO RICO	794	527	69	198	267
TOTALS	304,948	136,963	100,303	67,682	167,985

TABLE 5A

COUNT OF OPEN, CLOSED AND POSTED BRIDGES
ON FEDERAL-AID SYSTEM
AS OF DECEMBER 31, 1985

	BRIDGES IN INVENTORY	OPEN - NOT REQUIRING LOAD POSTING	CLOSED BRIDGES	POSTED BRIDGES	OPEN - SHOULD BE POSTED BUT ARE NOT POSTED
ALABAMA	7,585	2,075	25	142	5,343
ALASKA	565	522	2	38	3
ARIZONA	4,427	4,395	5	27	0
ARKANSAS	5,893	4,987	24	450	432
CALIFORNIA	14,782	14,672	24	76	10
COLORADO	3,488	3,368	3	106	11
CONNECTICUT	2,616	2,481	7	103	25
DELAWARE	466	435	7	19	5
DIST. OF COL.	223	166	2	55	0
FLORIDA	5,818	5,466	6	254	92
GEORGIA	7,886	7,436	6	418	26
HAWAII	672	637	0	32	3
IDAHO	1,663	1,465	0	198	0
ILLINOIS	10,480	9,905	70	290	215
INDIANA	7,179	6,420	15	478	266
IOWA	7,077	6,300	16	679	82
KANSAS	10,699	7,936	40	2,624	99
KENTUCKY	4,884	4,596	5	276	7
LOUISIANA	5,661	5,004	1	537	119
MAINE	1,250	1,221	1	21	7
MARYLAND	2,496	2,340	1	49	106
MASSACHUSETTS	3,654	3,076	58	471	49
MICHIGAN	5,790	5,180	121	454	35
MINNESOTA	5,032	4,796	4	199	33
MISSISSIPPI	7,456	3,745	9	3,662	40
MISSOURI	8,701	6,344	8	2,270	79
MONTANA	2,557	2,363	0	58	136
NEBRASKA	5,093	4,173	9	899	12
NEVADA	772	763	2	7	0
NEW HAMPSHIRE	1,205	1,148	1	56	0
NEW JERSEY	4,100	3,679	21	376	24
NEW MEXICO	2,861	2,810	5	38	8
NEW YORK	8,949	8,764	8	177	0
NORTH CAROLINA	5,373	4,487	14	872	0
NORTH DAKOTA	1,687	1,483	0	110	94
OHIO	12,152	11,390	28	533	201
OKLAHOMA	7,945	7,202	6	275	462
OREGON	3,746	3,615	5	103	23
PENNSYLVANIA	10,903	9,954	22	328	599
RHODE ISLAND	566	543	3	19	1
SOUTH CAROLINA	4,213	4,114	4	95	0
SOUTH DAKOTA	2,759	2,398	0	337	24
TENNESSEE	7,244	6,919	5	260	60
TEXAS	25,201	24,544	2	481	174
UTAH	1,465	1,388	3	26	48
VERMONT	1,291	1,250	0	41	0
VIRGINIA	6,834	6,283	7	536	8
WASHINGTON	3,965	3,885	3	68	9
WEST VIRGINIA	3,398	2,962	10	425	1
WISCONSIN	6,280	6,202	9	55	14
WYOMING	1,896	1,866	0	25	5
PUERTO RICO	883	863	1	19	0
TOTALS	269,781	240,016	628	20,147	8,990

TABLE 5B

COUNT OF OPEN, CLOSED AND POSTED BRIDGES
OFF FEDERAL-AID SYSTEM
AS OF DECEMBER 31, 1985

	BRIDGES IN INVENTORY	OPEN - NOT REQUIRING LOAD POSTING	CLOSED BRIDGES	POSTED BRIDGES	OPEN - SHOULD BE POSTED BUT ARE NOT POSTED
ALABAMA	7,753	1,240	67	862	5,584
ALASKA	253	130	20	64	39
ARIZONA	803	683	23	94	3
ARKANSAS	7,244	3,020	63	571	3,590
CALIFORNIA	7,487	6,740	30	618	99
COLORADO	3,734	1,788	24	1,906	16
CONNECTICUT	1,146	920	22	159	45
DELAWARE	262	204	5	49	4
DIST. OF COL.	13	11	0	2	0
FLORIDA	4,197	2,735	41	1,094	327
GEORGIA	6,295	3,174	175	2,527	419
HAWAII	369	275	1	67	26
IDAHO	2,053	1,363	4	686	0
ILLINOIS	14,662	10,160	499	2,626	1,377
INDIANA	10,438	4,633	138	3,234	2,433
IOWA	18,975	9,225	268	8,681	801
KANSAS	15,046	5,923	437	8,404	282
KENTUCKY	7,587	6,506	65	942	74
LOUISIANA	6,401	3,651	49	1,310	3,391
MAINE	1,351	1,038	9	110	194
MARYLAND	1,891	1,234	12	268	377
MASSACHUSETTS	1,207	672	70	435	30
MICHIGAN	4,735	2,567	308	1,806	54
MINNESOTA	7,876	6,146	76	1,562	92
MISSISSIPPI	9,270	3,484	84	5,612	90
MISSOURI	15,095	11,755	253	3,012	75
MONTANA	2,334	1,103	4	631	596
NEBRASKA	11,001	2,599	171	8,072	159
NEVADA	255	231	5	17	2
NEW HAMPSHIRE	1,335	638	38	656	3
NEW JERSEY	1,775	1,113	42	591	29
NEW MEXICO	571	401	5	156	9
NEW YORK	8,491	6,752	81	1,658	0
NORTH CAROLINA	10,429	3,640	39	6,748	2
NORTH DAKOTA	3,731	1,579	34	1,609	509
OHIO	16,825	9,921	150	5,620	1,134
OKLAHOMA	14,877	10,833	173	3,741	130
OREGON	2,816	2,410	9	340	57
PENNSYLVANIA	11,179	7,011	178	3,057	933
RHODE ISLAND	133	102	5	24	2
SOUTH CAROLINA	4,670	3,879	26	765	0
SOUTH DAKOTA	4,292	1,783	71	2,319	119
TENNESSEE	11,103	7,739	202	1,939	1,223
TEXAS	18,546	16,391	103	2,044	8
UTAH	984	595	23	161	185
VERMONT	1,364	1,200	13	151	0
VIRGINIA	5,676	3,341	8	2,324	3
WASHINGTON	2,833	2,502	26	296	9
WEST VIRGINIA	3,261	1,776	55	1,427	3
WISCONSIN	8,808	5,450	53	1,100	5
WYOMING	942	396	10	217	319
PUERTO RICO	794	779	4	11	0
TOTALS	304,948	183,441	4,271	92,375	24,861

APPENDIX A

CODE OF FEDERAL REGULATIONS

23 HIGHWAYS - PART 650

Subpart D—Highway Bridge Replacement and Rehabilitation Program

§ 650.401 Purpose.

The purpose of this regulation is to prescribe policies and outline procedures for administering the Highway Bridge Replacement and Rehabilitation Program in accordance with 23 U.S.C. 144.

§ 650.403 Definitions of terms.

(a) *Bridge.* A structure, including supports, erected over a depression or an obstruction, such as water, a highway, or a railway, having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of the openings for multiple boxes; it may include multiple pipes where the clear distance between openings is less than half of the smaller contiguous opening.

(b) *Sufficiency rating.* The numerical rating of a bridge based on its structural adequacy and safety, essentiality for public use, and its serviceability and functional obsolescence.

(c) *Rehabilitation.* The major work required to restore the structural integrity of a bridge as well as work necessary to correct major safety defects.

§ 650.405 Eligible projects.

(a) *General.* Deficient highway bridges on all public roads may be eligible for replacement or rehabilitation.

(b) *Types of projects which are eligible.* The following types of work are eligible for participation in the Highway Bridge Replacement and Rehabilitation Program (HBRRP), hereinafter known as the bridge program.

(1) *Replacement.* Total replacement of a structurally deficient or functionally obsolete bridge with a new facility constructed in the same general traffic corridor. A nominal amount of approach work, sufficient to connect the new facility to the existing roadway or to return the gradeline to an attainable touchdown point in accordance with good design practice is also eligible. The replacement structure must meet the current geometric, construction and structural standards required for the types and volume of projected traffic on the facility over its design life.

(2) *Rehabilitation.* The project requirements necessary to perform the major work required to restore the structural integrity of a bridge as well as work necessary to correct major safety defects are eligible except as noted under ineligible work. Bridges to be rehabilitated both on or off the F-A System shall, as a minimum, conform with the provisions of 23 CFR Part 625, Design Standards for Federal-aid Highways, for the class of highway on which the bridge is a part.

(c) *Ineligible work.* Except as otherwise prescribed by the Administrator, the costs of long approach fills, causeways, connecting roadways, interchanges, ramps, and other extensive earth structures, when constructed beyond the attainable touchdown point, are not eligible under the bridge program.

§ 650.407 Application for bridge replacement or rehabilitation.

(a) Agencies participate in the bridge program by conducting bridge inspections and submitting Structure Inventory and Appraisal (SI&A) sheet inspection data. Federal and local governments supply SI&A sheet data to the State agency for review and processing. The State is responsible for submitting the six computer card format or tapes containing all public road SI&A sheet bridge information through the Division Administrator of the Federal Highway Administration (FHWA) for processing. These requirements are prescribed in 23 CFR 650.309 and 650.311, the National Bridge Inspection Standards.

(b) Inventory data may be submitted as available and shall be submitted at such additional times as the FHWA may request.

(c) Inventory data on bridges that have been strengthened or repaired to eliminate deficiencies, or those that have been replaced or rehabilitated using bridge replacement and/or other funds, must be revised in the inventory through data submission.

(d) The Secretary may, at the request of a State, inventory bridges, on and off the Federal-aid system, for historic significance.

§ 650.409 Evaluation of bridge inventory.

(a) *Sufficiency rating of bridges.* Upon receipt and evaluation of the bridge inventory, a sufficiency rating will be assigned to each bridge by the Secretary in accordance with the approved AASHTO [1] sufficiency rating formula. The sufficiency rating will be used as a basis for establishing eligibility and priority for replacement or rehabilitation of bridges; in general the lower the rating, the higher the priority.

(b) *Selection of bridges for inclusion in State program.* After evaluation of the inventory and assignment of sufficiency ratings, the Secretary will provide the State with a selection list of bridges within the State that are eligible for the bridge program. From that list or from previously furnished selection lists, the State may select bridge projects.

§ 650.411 Procedures for bridge replacement and rehabilitation projects.

(a) Consideration shall be given to projects which will remove from service highway bridges most in danger of failure.

(b) *Submission and approval of projects.* (1) Bridge replacement or rehabilitation projects shall be submitted by the State to the Secretary in accordance with 23 CFR Part 630 Subpart A Federal-Aid Programs, Approval and Authorization.

(2) Funds apportioned to a State shall be made available throughout each State on a fair and equitable basis.

(c)(1) Each approved project will be designed, constructed, and inspected for acceptance in the same manner as other projects on the system on which the project is located. It shall be the responsibility of the State agency to properly maintain, or cause to be properly maintained, any project constructed under this bridge program. The State highway agency shall enter into a formal agreement for maintenance with appropriate local government officials in cases where an eligible project is located within and is under the legal authority of such a local government.

(2) Whenever a deficient bridge is replaced or its deficiency alleviated by a new bridge under the bridge program, the deficient bridge shall either be dismantled or demolished or its use limited to the type and volume of traffic the structure can safely service over its remaining life. For example, if the only deficiency of the existing structure is inadequate roadway width and the combination of the new and existing structure can be made to meet current standards for the volume of traffic the facility will carry over its design life, the existing bridge may remain in place and be incorporporated into the system.

§ 650.413 Funding.

(a) Funds authorized for carrying out the Highway Bridge Replacement and Rehabilitation Program are available for obligation at the beginning of the fiscal year for which authorized and remain available for expenditure for the same period as funds apportioned for projects on the Federal-aid primary system.

(b) The Federal share payable on account of any project carried out under 23 U.S.C. 144 shall be 80 percent of the eligible cost.

(c) Not less than 15 percent nor more than 35 percent of the apportioned funds shall be expended for projects located on public roads, other than those on a Federal-aid system. The Secretary after consultation with State and local officials may, with respect to a State, reduce the requirement for expenditure for bridges not on a Federal-aid system when he determines that such State has inadequate needs to justify such expenditure.

§ 650.415 Reports.

The Secretary must report annually to the Congress on projects approved and current inventories together with recommendations for further improvements.

Effective Date:
December 13, 1979

APPENDIX B

CODE OF FEDERAL REGULATIONS

23 HIGHWAYS - PART 650

Subpart C—National Bridge Inspection Standards

§ 650.301 Application of standards.

The National Bridge Inspection Standards in this part apply to all structures defined as bridges located on all public roads. In accordance with the AASHTO (American Association of State Highway and Transportation Officials) Highway Definitions Manual, a "bridge" is defined as a structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.

§ 650.303 Inspection procedures.

(a) Each highway department shall include a bridge inspection organization capable of performing inspections, preparing reports, and determining ratings in accordance with the provisions of the AASHTO Manual [1] and the Standards contained herein.

(b) Bridge inspectors shall meet the minimum qualifications stated in § 650.307.

[1] The "AASHTO Manual" referred to in this part is the "Manual for Maintenance Inspection of Bridges 1979" published by the American Association of State Highway and Transportation Officials. A copy of the Manual may be examined during normal business hours at the office of each Division Administrator of the Federal Highway Administration, at the office of each Regional Federal Highway Administrator, and at the Washington Headquarters of the Federal Highway Administration. The addresses of these document inspection facilities are set forth in Appendix D to Part 7 of the regulations of the Office of the Secretary (49 CFR Part 7). In addition, a copy of the Manual may be secured upon payment in advance by writing to the American Association of State Highway and Transportation Officials, 444 N. Capitol Street, NW., Suite 225, Washington, D.C. 20001.

(c) Each structure required to be inspected under the Standards shall be rated as to its safe load carrying capacity in accordance with section 4 of the AASHTO Manual. If it is determined under this rating procedure that the maximum legal load under State law exceeds the load permitted under the Operating Rating, the bridge must be posted in conformity with the AASHTO Manual or in accordance with State law.

(d) Inspection records and bridge inventories shall be prepared and maintained in accordance with the Standards.

§ 650.305 Frequency of inspections.

(a) Each bridge is to be inspected at regular intervals not to exceed 2 years in accordance with section 2.3 of the AASHTO Manual.

(b) The depth and frequency to which bridges are to be inspected will depend on such factors as age, traffic characteristics, state of maintenance, and known deficiencies. The evaluation of these factors will be the responsibility of the individual in charge of the inspection program.

§ 650.307 Qualifications of personnel.

(a) The individual in charge of the organizational unit that has been delegated the responsibilities for bridge inspection, reporting, and inventory shall possess the following minimum qualifications:

(1) Be a registered professional engineer; or

(2) Be qualified for registration as a professional engineer under the laws of the State; or

(3) Have a minimum of 10 years experience in bridge inspection assignments in a responsible capacity and have completed a comprehensive training course based on the "Bridge Inspector's Training Manual," [2] which has been developed by a joint Federal-State task force.

(b) An individual in charge of a bridge inspection team shall possess the following minimum qualifications:

(1) Have the qualifications specified in paragraph (a) of this section; or

(2) Have a minimum of 5 years experience in bridge inspection assignments in a responsible capacity and have completed a comprehensive training course based on the "Bridge Inspector's Training Manual," which has been developed by a joint Federal-State task force.

[2] The "Bridge Inspector's Training Manual" may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

§ 650.309 Inspection report.

The findings and results of bridge inspections shall be recorded on standard forms. The data required to complete the forms and the functions which must be performed to compile the data are contained in section 3 of the AASHTO Manual.

§ 650.311 Inventory.

(a) Each State shall prepare and maintain an inventory of all bridge structures subject to the Standards. Under these Standards, certain structure inventory and appraisal data must be collected and retained within the various departments of the State organization for collection by the Federal Highway Administration as needed. A tabulation of this data is contained in the structure inventory and appraisal sheet distributed by the Federal Highway Administration as part of the Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges (Coding Guide) in January of 1979. Reporting procedures have been developed by the Federal Highway Administration.

(b) All bridges subject to these Standards shall be inventoried by December 31, 1980, as required by section 124(a), and (c) of the Surface Transportation Assistance Act of 1978. Newly completed structures or any modification of existing structures which would alter previously recorded data on the inventory forms shall be entered in the State's records within 90 days.

Effective Date:
May 1, 1979

APPENDIX C

Federal Register / Vol. 48, No. 223 / Thursday, November 17, 1983 / Rules and Regulations

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

23 CFR Part 650

Bridges, Structures, and Hydraulics; Discretionary Bridge Criteria

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Final rule.

Subpart G—Discretionary Bridge Candidate Rating Factor

Sec.

650.701 Purpose.

650.703 Eligible projections. for discretionary bridge funds.

650.705 Application for discretionary bridge funds.

650.707 Rating factor.

650.709 Special considerations.

Authority: 101, Pub. L. 97-424, 96 Stat. 2097; 23 U.S.C. 144, 315; 49 CFR 1.48(b).

Subpart G—Discretionary Bridge Candidate Rating Factor

§ 650.701 Purpose.

The purpose of this regulation is to describe a rating factor used as part of a selection process of allocation of discretionary bridge funds made available to the Secretary of Transportation under 23 U.S.C. 144.

§ 650.703 Eligible projects.

(a) Deficient highway bridges on Federal-aid highway system roads may be eligible for allocation of discretionary bridge funds to the same extent as they are for bridge funds apportioned under 23 U.S.C. 144, provided that the total project cost for a discretionary bridge candidate is at least $10 million or twice the amont of 23 U.S.C. 144 funds apportioned to the State during the fiscal year for which funding for the candidate bridge is requested.

(b) After the effective date of this regulation for the discretionary bridge candidate rating factor, only candidate bridges not previously selected with a computed rating factor of 100 or less will be eligible for consideration.

§ 650.705 Application for discretionary bridge funds.

Each year through its field offices, the FHWA will issue an annual call for discretionary bridge candidate submittals including updates of previously submitted but not selected projects. Each State is responsible for submitting such data as required for candidate bridges. Data requested will include structure number, funds needed by fiscal year, total project cost, current average daily truck traffic and a narrative describing the existing bridge, the proposed new or rehabilitated bridge and other relevant factors which the State believes may warrant special consideration.

§ 650.707 Rating factor.

(a) The following formula is to be used in the selection process for ranking discretionary bridge candidates:

$$\text{Rating Factor (RF)} = \frac{SR}{D} \times \frac{TPC}{ADT'} \times \left[1 + \frac{\text{Unobligated HBRRP Balance}}{\text{Total HBRRP Funds Received}}\right]$$

The lower the rating factor, the higher the priority for selection and funding.

(b) The terms in the rating factor are defined as follows:

SR is Sufficiency Rating computed as illustrated in Appendix A of the Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, USDOT/FHWA (latest edition); (If SR is less than 1.0, use SR = 1.0);

ADT is Average Daily Traffic in thousands taking the most current value from the national bridge inventory data.

ADTT is Average Daily Truck Traffic in thousands (Pick up trucks and light delivery trucks not included).

For load posted bridges, the ADTT furnished should be that which would use the bridge if traffic were not restricted.

The ADTT should be the annual average volume, not peak or seasonal.

D is Defense Highway System Status

D = 1 if not on defense highway

D = 1.8 if bridge carries a designated defense highway

The last term of the rating factor expression includes the State's unobligated balance of funds received under 23 U.S.C. 144 as of June 30 preceding the date of calculation, and the total funds received under 23 U.S.C. 144 for the last four fiscal years ending with the most recent fiscal year of the FHWA's annual call for discretionary bridge candidate submittals; (if unobligated HBRRP balance is less than $10 million, use zero balance);

TPC is Total Project Cost in millions of dollars;

HBRRP is Highway Bridge Replacement and Rehabilitation Program;

ADT' is ADT plus ADTT.

(c) In order to balance the relative importance of candidate bridges with very low (less than one) sufficiency ratings and very low ADT's against candidate bridges with high ADT's, the minimum sufficiency rating used will be 1.0. If the computed sufficiency rating for a candidate bridge is less than 1.0, use 1.0 in the rating factor formula.

(d) If the unobligated balance of HBRRP funds for the State is less than $10 million, the HBRRP modifier is 1.0. This will limit the effect of the modifier on those States with small apportionments or those who may be accumulating funds to finance a major bridge.

§ 650.709 Special considerations.

(a) The selection process for new discretionary bridge projects will be based upon the rating factor priority ranking. However, although not specifically included in the rating factor formula, special consideration will be given to bridges that are closed to all traffic or that have a load restriction of less than 10 tons. Consideration will also be given to bridges with other unique situations, and to bridge candidates in States which have not previously been allocated discretionary bridge funds.

(b) The need to administer the program from a balanced national perspective requires that the special cases set forth in paragraph (a) of this section and other unique situations be considered in the discretionary bridge candidate evaluation process.

(c) Priority consideration will be given to the continuation and completion of bridge projects previously begun with discretionary bridge funds.